BROADBAND Broadband Internet Gateway

networks@work

USER'S MANUAL

COMPEX NETPASSAGE SERIES

NetPassage 16A

NetPassage 16A

NetPassage 16A

NetPassage 16A

NetPassage 16A

Manual number : U-0363-V1.1C

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FCC NOTICE

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

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Increase the separation between the computer and receiver.

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This device may not cause harmful interference, and

This device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity

Compex, Inc. declares the following:

Product Name: **Broadband Internet Gateway** Model No.: **Compex NetPassage 16A** conforms to the following Product Standards: Radiated Emission Standards: EN55022A, FCC Part 15 Class A; Conducted Emission Standards: EN60555Pt2 conducted emission; EN55022A conducted emission, FCC Part 15 Class A; Immunity Standards: IEC 801-2; IEC 801-3; IEC 801-4. **Therefore, this product is in conformity with the following regional standards**: **FCC Class A** - following the provisions of FCC Part 15 directive;

CE Mark - following the provisions of the EC directive.

This Class A digital apparatus complies with Canadian ICES-003.

15th January 2003

Shi Jia Xiang
R & D Manager

Technical Support Information

The warranty information and registration form are found in the Quick Install Guide.

For technical support, you may contact Compex or its subsidiaries. For your convenience, you may also seek technical assistance from the local distributor, or from the authorized dealer/reseller that you have purchased this product from. For technical support by email, write to support@compex.com.sg.

Refer to the table below for the nearest Technical Support Centers:

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☎ Call	Tel: +1 (714) 630-7302 (8 a.m.-5 p.m. Pacific time) Tel: +1 (800) 279-8891 (Ext.122 Technical Support)
Fax	Fax: +1 (714) 630-6521 BBS: +1 (714) 630-2570 (24-hour access)
Europe	
✉ Write	**ReadyLINK Networktechnology Gmbh** Albert Einstein Straŋe 34/M21 63322 Rödermark, Germany
☎ Call Fax	Tel: +49 (0) 6074 - 98017 (8 a.m.-5 p.m. local time) Fax: +49 (0) 6074 - 90668 BBS: +49 (0) 6074 - 93974 (24-hour access) Support Email: readylink@compex.com.sg
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✉ Write	**Compex Systems Pte Ltd** 135, Joo Seng Road #08-01, PM Industrial Building Singapore 368363
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Internet access/ Website:	E-mail: **support@compex.com.sg** FTPsite: **ftp.compex.com.sg** **http://www.cpx.com** *or* **http://www.compex.com.sg**

About This Document

The product described in this document, Compex Broadband Internet Gateway Series, NetPassage 16A is a licensed product of Compex Systems Pte Ltd. This document contains instructions for installing, configuring and using Compex NetPassage 16A. It also gives an overview of the key applications and the networking concepts with respect to the product.

This documentation is for both Network Administrators and the end users who possess some basic knowledge in the networking structure and protocols.

It makes a few assumptions that the host computer has already been installed with TCP/IP and ready to access Internet. Procedures for Windows 95/98/ME/2000/XP operating systems are included in this document. However, for other operating system, you may need to refer to your operating system's documentation for networking.

How to Use this Document

The document is written in such a way that you as a user will find it convenient to find specific information pertaining to the product. It comprises of chapters that explain in details on the installation and configuration of Compex NetPassage 16A.

Software

Universal Configuration (uConfig) patent pending.

Conventions

In this document, special conventions are used to help and present the information clearly. The Compex Broadband Internet Gateway NetPassage 16A is often referred to as Compex NetPassage 16A in this document. Below is a list of conventions used throughout.

NOTE
This section will consist of important features or instructions

CAUTION
This section concerns risk of injury, system damage or loss of data

WARNING
This section concerns risk of severe injury

References on Menu Command, Push Button, Radio Button, LED and Label appear in **Bold**. For example, "Click on the "Ok" button"

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Chapter 1 Product Overview

1.1 Introduction

*Wireless LAN Card not included.

Compex NetPassage 16A is a Broadband Internet Gateway supporting external Cable/ADSL modem for broadband Internet sharing. It is integrated with a 4-port 10/100Mbps Fast Ethernet Switch and a PCMCIA slot for Compex Wireless LAN card to provide Wireless LAN option that allows seamless distribution of Internet access to the wired and wireless networks.

With the unique Parallel Broadband, Compex NetPassage 16A delivers scalable Internet bandwidth to your network, supporting Load Balancing and Fail-Over Redundancy with multiple broadband channels.

In addition, Compex NetPassage 16A is also designed with Wireless Pseudo VLAN. While WEP provides security for wireless LAN access, Wireless Pseudo VLAN ensures privacy among the wireless clients.

Other advanced features such as Virtual Server, Time-based Access Management, IP Packet Filtering and Remote Management have also been designed on Compex NetPassage 16A. It is the complete Internet solution for your home and office.

1.2 Key Features

Compex NetPassage 16A, the Broadband Internet Gateway, is designed with the following features:

1.2.1 Broadband Internet Sharing

Compex NetPassage 16A comes with a RJ45 Ethernet WAN port supporting external Cable or ADSL modem, sharing a single Cable/ADSL Internet subscription with multiple users.

1.2.2 Integrated 4-port 10/100Mbps Switch

Integrated with a 4-port 10/100Mbps Fast Ethernet Switch, Compex NetPassage 16A provides an immediate solution for four users on private LAN switching. With the auto-crossover mechanism, hubs or switches can be easily cascaded to Compex NetPassage 16A easily to support more users.

1.2.3 Wireless LAN Option

Compex NetPassage 16A is designed with a Type II PCMCIA slot, supporting Compex 11Mbps Wireless LAN card for Wireless LAN implementation. Compex NetPassage 16A activated with wireless LAN distributes Internet access to the 11Mbps Wireless LAN while bridging the wireless segment to the Fast Ethernet segment. Alternatively, you may also configure the Wireless LAN option to operate in Client Mode as a LAN-to-LAN Wireless Bridge

1.2.4 Firewall Security Features

Firewall function is built into Compex NetPassage 16A. This SPI firewall improves the security of your network. It provides a first level of defense against hackers.

1.2.5 Wireless Pseudo VLAN

While Wired Equivalent Privacy (WEP) provides security for wireless LAN access, the Wireless Pseudo VLAN, engineered by Compex, offers another level of privacy for the users. It segregates the Wireless LAN into multiple Pseudo VLANs, supporting a single user per Pseudo VLAN, or a group of users for each Pseudo VLAN.

1.2.6 56K Dial-Up Backup Connection

Designed with a RS232 serial interface, Compex NetPassage 16A may be installed with a V.90 56k analog modem, utilizing the 56K dial-up connection as the backup link to the Internet. In addition, it allows connectivity to Diva ISDN modem.

1.2.7 Built-In DHCP Server

Compex NetPassage 16A is integrated with a DHCP server, dynamically assigns IP address, gateway information and DNS server addresses to your PCs in the wired and wireless networks. Simply configure your PCs to dynamically obtain IP addresses.

1.2.8 Virtual Server

Compex NetPassage 16A supports Virtual Server that enables hosting of Internet servers in your private network. Virtual Server based on Port Forwarding and IP Forwarding may be defined on Compex NetPassage 16A.

1.2.9 Time-based Access Management

With Time-based Access Management, the network administrators may define administrative function on Compex NetPassage 16A, restricting certain PCs to access to the Internet during a pre-defined time.

1.2.10 IP Packet Filtering

The network administrators may also define functions on Compex NetPassage 16A to filter undesired Internet applications in the private network based on the TCP/UDP ports.

1.2.11 Web-based Configuration Interface

Compex NetPassage 16A is integrated with an embedded HTTP server, facilitating the configuration process with a user-friendly web-based interface. Simply connect to Compex NetPassage 16A with a JAVA-enabled web browser and complete the configuration process in just a few minutes.

1.2.12 Remote Management

Remote Management may be activated on Compex NetPassage 16A, enabling the network administrator to manage the Broadband Internet Gateway over the Internet with a HTTP or TELNET session.

1.3 Package Contents

Your Compex NetPassage 16A retail package contains the following items:

1 x Compex NetPassage 16A
1 x External Power Adapter ($5V_{DC}$, 3A) and 1 x Power Cord
1 x Quick Install Guide with Warranty Registration Form
1 x Product CD (consist of User's Manual, Firmware Recovery Tool & Utility)

1.4 Panel Views and Descriptions

1.4.1 Panel Views

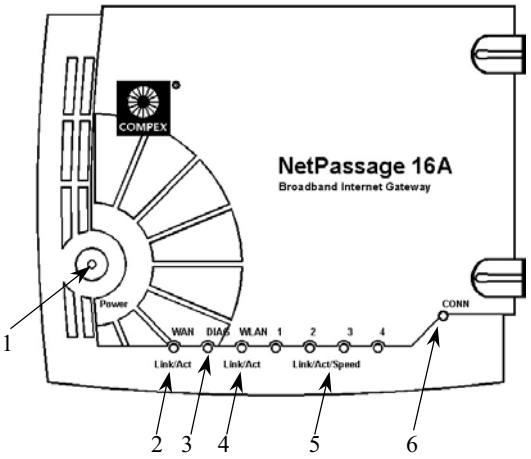


Figure 1.4a Front View of Compex NetPassage 16A

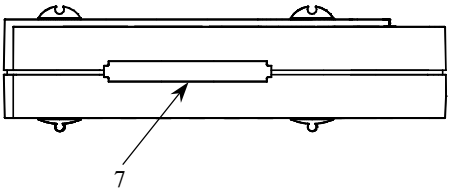


Figure 1.4b Side View of Compex NetPassage 16A

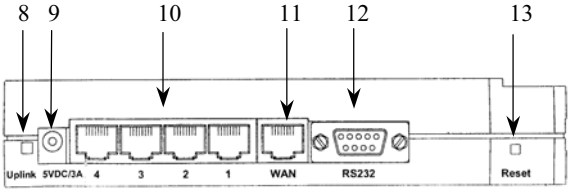


Figure 1.4c Back View of Compex NetPassage 16A

1.4.2 Panel Features

	Indicator	Description
1	Power (LED)	*Steady Green* indicates that the power has been turned on
2	WAN Link/Act (LED)	*Steady Amber* indicates that the connectivity is linked at 100Mbps *Flashing Amber* indicates that 100Mbps data transmission is detected at the respective port *Steady Green* indicates that the connectivity is linked at 10Mbps *Flashing Green* indicates that 10Mbps data transmission is detected at the respective port
3	DIAG (LED)	*Steady Green* indicates potential problem with router

	Indicator	Description
4	WLAN Link/Act (LED)	*Steady Green* indicates that at least one wireless client is present *Flashing Green* indicates that activity is detected in the wireless network
5	1, 2, 3, 4 Link/Act/Speed (LEDs)	Four Link/Activity/Speed LEDs for the integrated Fast Ethernet Switch. *Steady Amber* indicates that the connectivity is linked at 100Mbps *Flashing Amber* indicates that 100Mbps data transmission is detected at the respective port *Steady Green* indicates that the connectivity is linked at 10Mbps *Flashing Green* indicates that 10Mbps data transmission is detected at the respective port
6	CONN (LED)	*Steady Green* indicates that the WAN connection is established *Flashing Green* indicates that the WAN connection is NOT established *Rapid Flashing Green* indicates that the firmware has been corrupted If the WAN interface is configured with Static IP, this LED will not light up
7	PCMCIA Slot	PCMCIA slot for a Wireless LAN card to be installed
8	UpLink (Push Button)	Allows you to set Port 4 to become an uplink port. 1)Push-in – normal 2)Push-out - uplink
9	5V DC/3A (DC Input)	5V, 3A DC power input
10	1, 2, 3, 4 (RJ45 Ports)	Integrated 4-port 10/100Mbps Switch
11	WAN (RJ45 Ports)	10Base-T and 100Base-TX Port connects to cable modem or xDSL modem.

12	RS232 (DB9 Serial Interface)	RS232 Serial Interface for two functions: Connecting to Compex NetPassage 16A Command Console using RS232 crossover serial cable Connected to an external V.90 56K analog modem for 56K backup connection
13	Reset (Push Button) 1) Push once and release 2) Push and hold 3-7 sec 3) Push and hold 7-12sec 4) Push and hold >12 sec	<u>CONN LED Lights</u> 1) Steady On indicates normal reboot 2) Blink fast (2 flash/sec) indicates password reset to default 3) Blink slowly (1 flash/sec) indicates configuration reset to factory default. 4) Steady On indicates normal reboot

1.5 Specifications

1.5.1 Compex NetPassage 16A Specifications

⊄#	Industry Standards	Complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3x Flow Control CE Mark, FCC Class A, Gost, C-Tick, UL
⊄#	WAN Interface	One RJ45 Ethernet port (for external Cable/ADSL modem) One RS232 serial port (for external V.90 56K analog modem)
⊄#	WAN Type	Static IP Dynamic IP PPP Over Ethernet (PPPoE) Remote Access Service 56K Analog Dial-Up
⊄#	LAN Interface	Integrated 4-port 10/100Mbps Switch One Type II PCMCIA (for an 11Mbps Wireless LAN Card)
⊄#	IP Addressing	All Classful/Classless Subnets

⊄#	Built-In DHCP Server	Yes
⊄#	DHCP Reservation	By MAC Address
⊄#	NAT Firewall	Yes
⊄#	Load Balancing	Parallel Broadband
⊄#	Fail-Over Redundancy	Parallel Broadband
⊄#	Virtual Server	Based on Port Forwarding & IP Forwarding
⊄#	Time-based Access Management	Yes
⊄#	IP Packet Filtering	By TCP Port By Source IP
⊄#	IP Routing	Static & Dynamic Entry
⊄#	Routing Protocol	RIP1 & RIP2
⊄#	VPN Client Pass-Through	PPTP IPSec L2TP
⊄#	Microsoft NetMeeting	Yes
⊄#	Configuration Interface	Web-based Configuration Interface TELNET/RS232 Command Console
⊄#	Remote Management	HTTP & TELNET Session
⊄#	Profile Backup & Restore	Yes
⊄#	Firmware Upgrade	Yes
⊄#	Environmental Requirement Temperature Humidity	 Operating: 0ºC to 40ºC Storage: -20ºC to 70ºC Operating: 10% to 80% RH Storage: 5% to 90% RH
⊄#	Physical Dimensions	180mm x 145mm x 33mm (L x W x H)
⊄#	Weight	– 0.8Kg (including power adapter)

1.5.2 Wireless LAN Specifications

⊄#	Industry Standards	IEEE 802.11, IEEE 802.11b
⊄#	Operating Frequency	2.4000 – 2.4835 (US & Canada) 2.4000 – 2.4970 (Europe) 2.4465 – 2.4835 (France)
⊄#	Radio Technology	Direct Sequence Spread Spectrum
⊄#	Frequency Channels	11 Channels (US & Canada) 13 Channels (Europe) 4 Channels (France)
⊄#	Data Rates	11Mbps, 5.5Mbps, 2Mbps, 1Mbps
⊄#	Wireless LAN Architecture	Infrastructure
⊄#	Private Encryption	64/128-bit WEP
⊄#	Wireless Pseudo VLAN	Per Node & Per Group
⊄#	Operating Mode	Access Point Mode Client Mode

Chapter 2 Getting Started

Compex NetPassage 16A may be used in different applications. It is integrated with an embedded HTTP server providing a user-friendly web-based configuration interface to ensure fast and easy configuration process for these applications. This chapter provides the information on how to connect to the configuration interface, how to setup the hardware for configuration and operation.

2.1 Hardware Setup

Compex NetPassage 16A may be installed in different applications. This section summarizes the hardware setup for each application.

2.1.1 Distributing Broadband Internet Access to Fast Ethernet Network

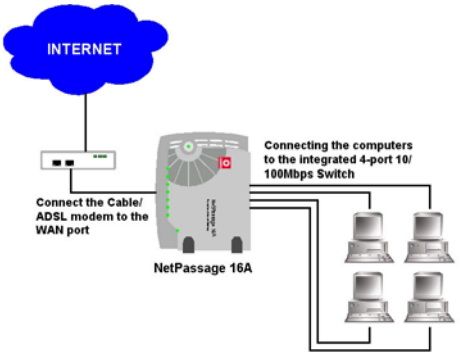

INTERNET
Connecting the computers to the integrated 4-port 10/100Mbps Switch
Connect the Cable/ ADSL modem to the WAN port
NetPassage 16A

Figure 2.1a Compex NetPassage 16A distributes broadband Internet access to the Fast Ethernet segment

In this hardware setup, four computers are connected to the integrated 4-port 10/100Mbps Fast Ethernet Switch of Compex NetPassage 16A. These computers are able to share a single broadband Internet account as well as their resources. You may also cascade Compex NetPassage 16A to another Hub or Switch to support more users. The Fast Ethernet ports of Compex NetPassage 16A are designed with auto-crossover mechanism that can be easily connected to another Hub or Switch regardless of the orientation of the UTP cable (straight or crossover).

2.1.2 Distributing Broadband Internet Access to Fast Ethernet & Wireless Network

Compex NetPassage 16A may be installed with a PCMCIA Wireless LAN card (iWavePort WL11A) to support broadband Internet sharing with wireless LAN clients. To install the wireless LAN card into Compex NetPassage 16A, you must first turn off the power supply of Compex NetPassage 16A, and gently insert the wireless LAN card into the PCMCIA slot of Compex NetPassage 16A.

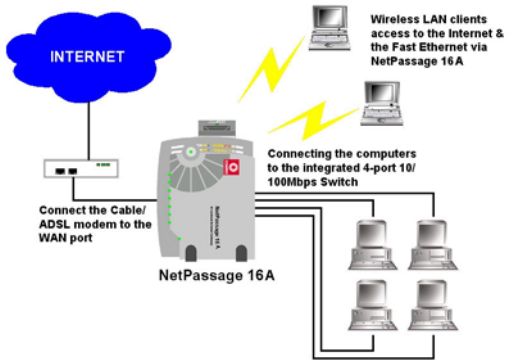

INTERNET
Wireless LAN clients access to the Internet & the Fast Ethernet via NetPassage 16A
Connecting the computers to the integrated 4-port 10/ 100Mbps Switch
Connect the Cable/ ADSL modem to the WAN port
NetPassage 16A

Figure 2.1b Compex NetPassage 16A distributes broadband Internet access to the Fast Ethernet and Wireless segment.

In this hardware setup, 4 computers are connected to the integrated 4-port 10/100Mbps Fast Ethernet Switch of Compex NetPassage 16A, whereas two notebook computers are connected to Compex NetPassage 16A via the IEEE 802.11b Wireless LAN. All of these computers are able to share a single broadband Internet account as well as sharing their resources.

2.1.3 Wireless LAN-to-LAN Connection with Broadband Internet Access

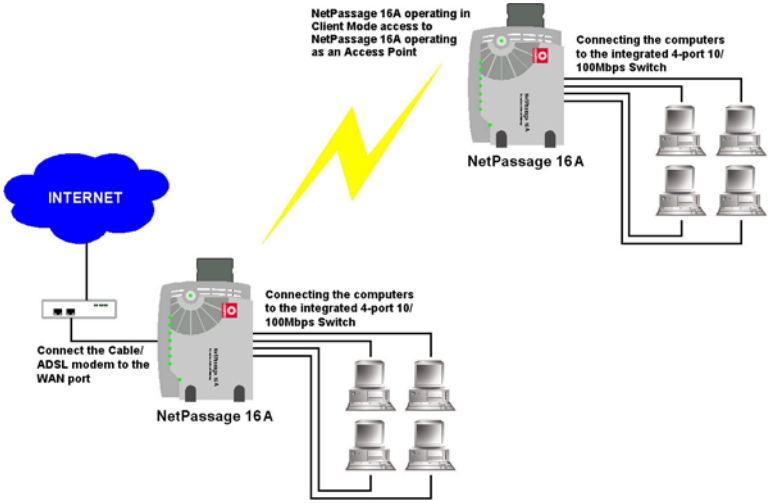

NetPassage 16A operating in Client Mode access to NetPassage 16A operating as an Access Point
Connecting the computers to the integrated 4-port 10/ 100Mbps Switch
NetPassage 16A
INTERNET
Connecting the computers to the integrated 4-port 10/ 100Mbps Switch
Connect the Cable/ ADSL modem to the WAN port
NetPassage 16A

Figure 2.1c Compex NetPassage 16A operating in Client Mode may access to Compex NetPassage 16A operating as an Access Point.

If you have two Fast Ethernet segments that are environmentally not possible to be connected by cable, you may configure two Compex NetPassage 16A in different mode, one in Client Mode and one as an Access Point, as shown in Figure 2.1c.

2.2 Using Universal Configuration (uConfig) Program to access to Internet

Compex NetPassage 16A supports Universal Configuration (uConfig) that enables you to connect to the Web-based Configuration Interface in effortlessly. There is no need to fiddle with the TCP/IP configuration of your computer. Compex NetPassage 16A comes with a uConfig agent and a window-based utility UCONFIG.EXE.

To connect to Compex NetPassage 16A's Web-based Configuration Interface via Universal Configuration (uConfig):

Save the file **UCONFIG.EXE** from the Product CD into your preferred directory.

Launch the Universal Configuration by double-clicking the file **UCONFIG.EXE**.

Universal Configuration will then display the information collected in the network, as shown below.

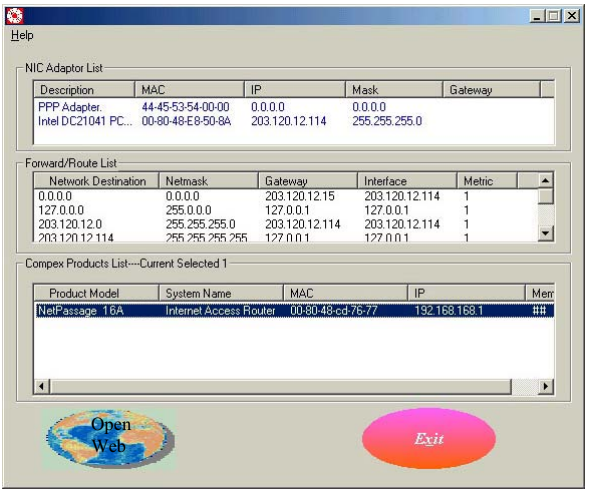


Figure 2.2a Universal Configuration

Select Compex NetPassage 16A from Compex Product List window and press the **OpenWeb** button. The login prompt shall appear.

Remote Access Router Manager
Please enter your password:
****
Log On !
(Forget your password? - see the User's Guide for instructions.)

Figure 2.2b Logon Page

Enter the password and press the **Log On!** button to login. The default password is *password*.

After you have completed the configuration, click on the **ExitUconfig** from the Command Menu. The Compex NetPassage 16A will then reboot.

Please proceed to **Section 3.1** to read more about network configuration.

CAUTION
Click on the **ExitUconfig** from the Command Menu to exit from the uConfig mode. If you do not exit the uConfig mode, the router may not function correctly.

2.3 NPfind Utility Software

In the event that you have forgotten Compex NetPassage 16A IP Address, Npfind is a utility program for Windows which can be used to find out the IP address of Compex's product. To check your IP Address of Compex NetPassage 16A,

1. Connect one end of the MDI straight cable to one of the LAN port of Compex NetPassage 16A, and the other end to your PC.

2. Next, insert Product CD to your CD-ROM Drive.

3. Go to DRIVERS & UTILITIES section and click on Npfind Utility Software.

The program will automatically display the IP address of the device found.

Figure 2.3a Npfind discovered Compex Product

Contact your area of support for help if needed, or write to us at support@compex.com.sg.

2.4 Alternative Approach to connect to the Configuration Interface

Compex NetPassage 16A is integrated with an embedded HTTP Server to provide a user-friendly web-based configuration interface. Alternatively, you may also connect to the Command Console of Compex NetPassage 16A via a TELNET session or a direct serial connection.

This section assumes that the IP address of your Compex NetPassage 16A has not been changed. It is still the default IP of **192.168.168.1**.

This section also assumes that the TCP/IP settings of your computer have been configured properly. To make sure that the TCP/IP of your computer has been configured properly, perform the following command at the DOS prompt:

C:\WINDOWS\PING 192.168.168.1

If you receive replies from the above command, it indicates that your computer has been properly configured with TCP/IP, else please proceed to **Section 2.5** to set up your TCP/IP for your computer.

2.4.1 Web-based Configuration Interface

To connect to the Web-based Configuration Interface of Compex NetPassage 16A, all you need is a web browser. The requirement of the web browser is stated below:

Web Browser:	Netscape Navigator 4.0 & above or Internet Explorer 4.0 & above
JAVA:	Enabled
Proxy Settings:	Cleared
Proxy Auto Discovery:	Disabled

Connecting to Web-based Configuration Interface

1. Launch the Internet Explorer or Netscape Navigator

2. Open the URL using the default IP of Compex NetPassage 16A. E.g. Type in **http://192.168.168.1** in the **Address** field of Internet Explorer.

3. The logon page will then be displayed, as shown in Figure 2.4a. The default password of Compex NetPassage 16A is "password" which is pre-filled in the password text box. Press the **Log On!** button to log in to Compex NetPassage 16A's Configuration Interface.

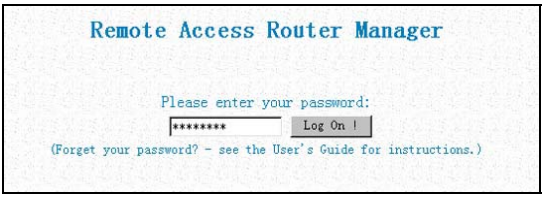

Remote Access Router Manager
Please enter your password:
****
Log On !
(Forget your password? - see the User's Guide for instructions.)

Figure 2.4a Logon Page

NOTE
If the proxy settings of your web browser is not cleared, you will not be able to connect to Compex NetPassage 16A's web-based configuration interface.

Once log on, you will see a web page consist of three frames, the **Command Menu**, **Configuration Window** and **Message Window**, as shown below.

Command Menu
Enable the user to select feature to be configured

Configuration Window
Enable the user to configure the parameters associated with the selected feature

Message Window
Display the message (if any) associated with the configuration process

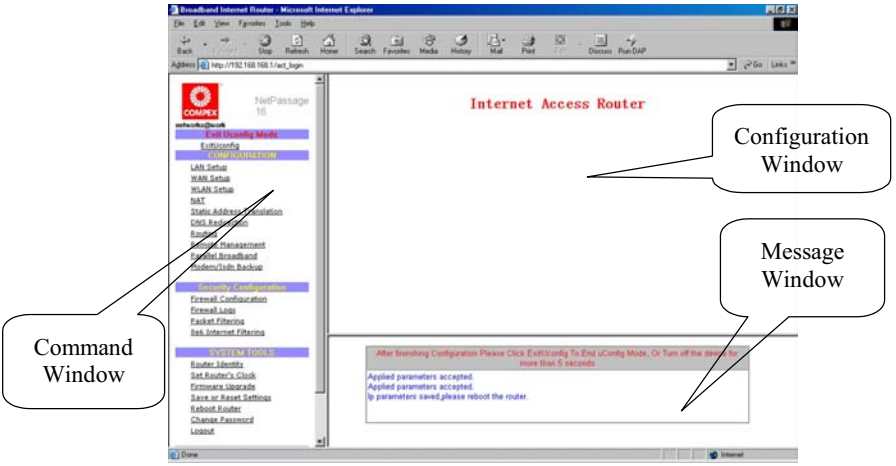


Figure 2.4b Compex NetPassage 16A Configuration Interface

2.4.2 TELNET Command Console

Alternatively, the user may connect to the Command Console of Compex NetPassage 16A via a TELNET session to the default IP of Compex NetPassage 16A, **192.168.168.1**. This section uses Microsoft TELNET command for instruction. You may use any TELNET client.

Connecting to Compex NetPassage 16A's Command Console via TELNET

1. Connect to Compex NetPassage 16A's Command Console with the following command at DOS prompt. The TELNET application will then be launched and connect to Compex NetPassage 16A.

   C:\WINDOWS\TELNET 192.168.168.1

2. At the login prompt, type in "password" (default password) and press the <ENTER> key, as shown in Figure 2.4c. You will then login to the Command Console of Compex NetPassage 16A.

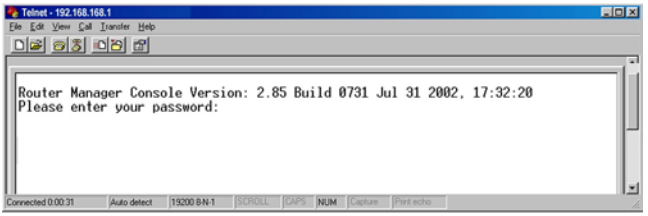


Figure 2.4c Command Console Login

NOTE
Please refer to Appendix A for the list of commands available at the console.

2.4.3 RS232 Serial Command Console

Apart from TELNET session, you may also connect to Compex NetPassage 16A's Command Console via direct serial connection using the RS232 crossover cable (also known as null modem cable). This section assumes that Hyper Terminal has been installed properly.

Direct Serial Connection to Compex NetPassage 16A's Command Console

1. Connect the RS232 serial port of Compex NetPassage 16A to the serial COM port of a computer using the RS232 crossover cable.

2. Power on Compex NetPassage 16A and launch the Hyper Terminal, as shown in Figure 2.4d.

3. Select the connection type from the drop down menu. For example, if the RS232 crossover cable is connected to the COM1 of your computer, select **Direct to Com 1**, as shown in Figure 2.4e. Press the **OK** button to proceed.

Figure 2.4d Launching Hyper Terminal

Figure 2.4e Selecting Communication Port

4. The Properties Window for the selected communication port will then be displayed, as shown below. Configure the selected communication port with the following settings and press the **OK** button to proceed.

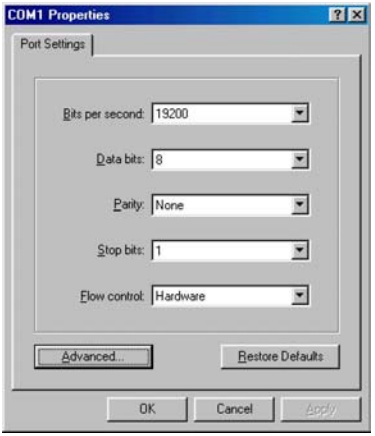


Figure 2.4f Configuring Communication Port

5. Once the Properties Window is closed, hit the <ENTER> key once for the login prompt to appear. Type in "password" (default password) and press the <ENTER> key to login to the console.

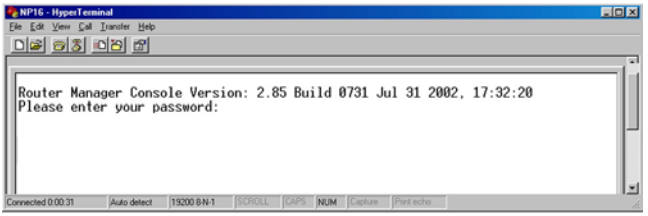


Figure 2.4g Command Console Login

NOTE
Please refer to Appendix A for the list of commands available at the console.

2.5 TCP/IP Configuration of the Computers

Compex NetPassage 16A is designed with a built-in DHCP server. You may manually configure the TCP/IP settings of your computers, or simply configure them to dynamically obtain IP address from the DHCP server. If you are not an expert user, you are advised to configure your computers to dynamically obtain IP addresses from the built-in DHCP server of Compex NetPassage 16A.

Before proceeding, please take note of the following default settings of Compex NetPassage 16A:

IP (LAN): **192.168.168.1**
Subnet Mask: **255.255.255.0**
DHCP Server: **Enabled**

2.5.1 Configuring your Computer to Dynamically Obtain IP Address

To configure your computers to dynamically obtain IP address, gateway and DNS information from Compex NetPassage 16A, perform the following actions:

For Microsoft Windows 95/98/98SE/ME

Open the **Control Panel** from the Start menu

Double-click on the **Network** icon, the network configuration window shall be displayed, as shown in Figure 2.5a.

Please ensure that the TCP/IP protocol is installed and bind to the network adapter.

Double-click on the TCP/IP that is bound to your network adapter, the TCP/IP configuration window shall be displayed, as shown in Figure 2.5b.

Press on the **Obtain an IP address automatically** radio button and press the **OK** button.

Press the **OK** button again to close the network configuration window. The Microsoft Windows will then prompt you to restart the computer. Press the **OK** button to reboot.

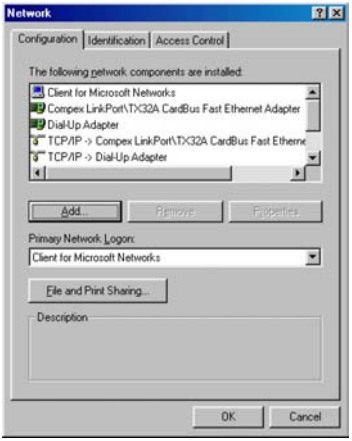


Figure 2.5a Network Configuration Window

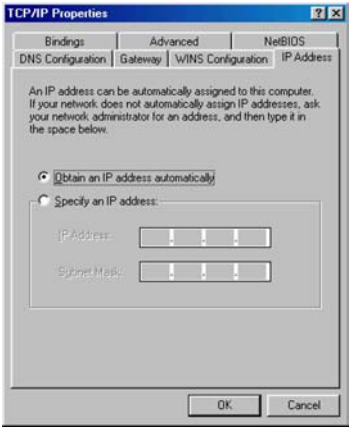

TCP/IP Properties
Bindings
Advanced
NetBIOS
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:
OK
Cancel

Figure 2.5b TCP/IP Properties Window

When the Microsoft Windows restarts, Compex NetPassage 16A will assign an IP address, Subnet Mask and Gateway information to the computer.

For Microsoft Windows 2000/XP:

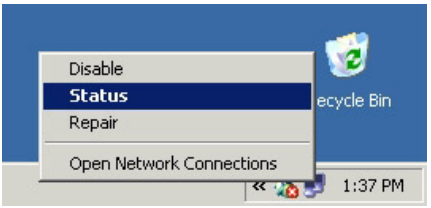


Figure 2.5c Network Connection

1) Right click on the network icon on the task bar and click on **status.** Click on **Properties** as in Figure 2.5c.

2) Highlight TCP/IP and click on **Properties** as in Figure 2.5d. Click on **Obtain an IP Address Automatically** and click on **OK** as in Figure 2.5e.

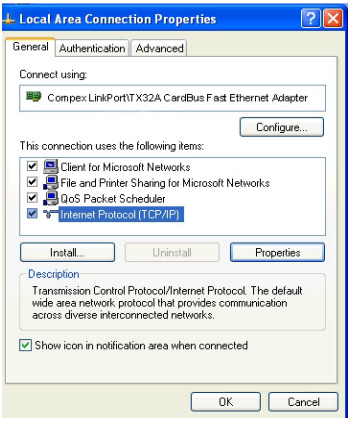


Figure 2.5d Configuration Screen 1

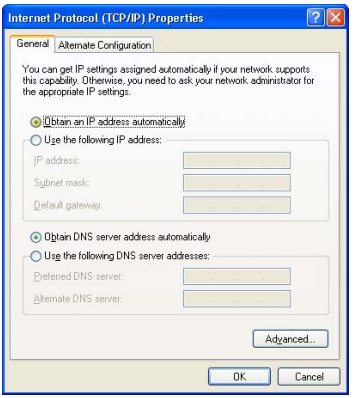

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 2.5e Configuration Screen 2

2.5.2 Configuring your Computer with Static IP Address

If you have chosen to configure your computer with Static IP address, please take note of the following default settings on Compex NetPassage 16A.

IP (LAN): **192.168.168.1**
Netmask: **255.255.255.0**

To log on to the Web-based Configuration Interface of Compex NetPassage 16A and to surf the Internet, you need to configure your computer with the following network settings:

IP: **192.168.168.X**
Subnet Mask: **255.255.255.0**
Gateway: **192.168.168.1**
DNS Server: **<IP address of DNS server>**

X is any integer from 2 to 254, and you cannot configure more than one computer with the same IP address.

<IP address of DNS server> is the IP address of a DNS server. This information is usually provided by your broadband Internet service provider.

NOTE
Compex NetPassage 16A is pre-configured with a subnet of 192.168.168.0. If you wish to configure your network with another subnet, you may do so after logging on to the configuration interface of Compex NetPassage 16A.

For Microsoft Windows 95/98/98SE/ME

*For Windows 2000/XP, follow the instructions in section 2.5.1 to get to the Network Configuration page.

1. Open the **Control Panel** from the Start menu

2. Double-click on the **Network** icon, the network configuration window shall be displayed, as shown in Figure 2.5a.

3. Double-click on the TCP/IP that is bound to your network adapter, the TCP/IP configuration window shall be displayed, as shown in Figure 2.5f.

   Type in the **IP Address** and **Subnet Mask** of 192.168.168.X and 255.255.255.0 respectively.

4. Select **Gateway** from the menu and the gateway configuration page shall be displayed, as shown in Figure 2.5g.

   Type in the **New gateway** as 192.168.168.1 and press the **Add** button.

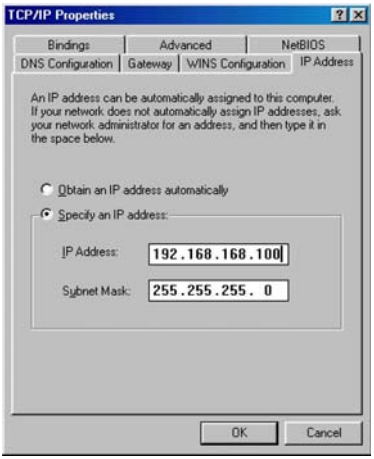


Figure 2.5f Specify an IP Address

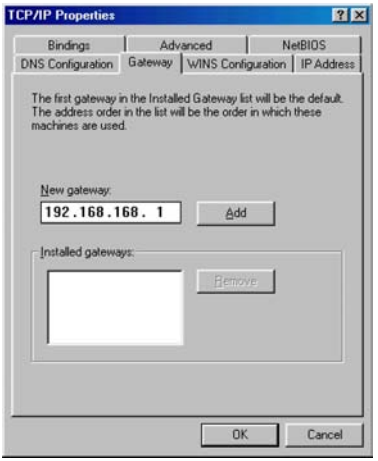
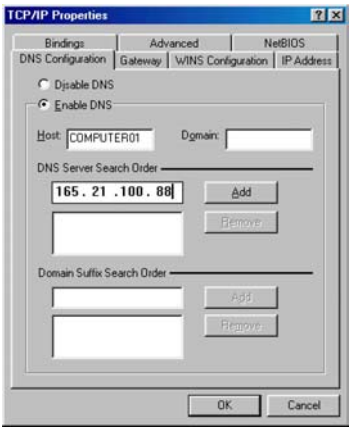


Figure 2.5g Gateway Configuration Window

5. Select **DNS Configuration** from the menu and the DNS configuration page shall be displayed, as shown in Figure 2.5h.

   Select the **Enable DNS** button. Type in a preferred name as the **Host**. Type in the IP address of your DNS server in the **DNS Server Search Order** field and press the **Add** button. Press the **OK** button to close this window.



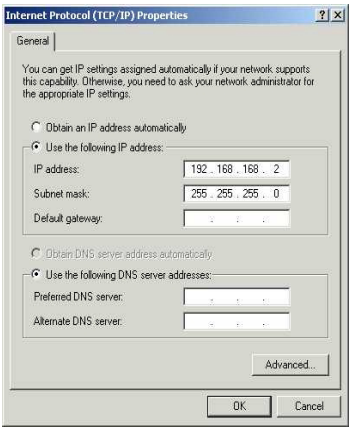

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 168 . 2
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure 2.5h DNS Configuration Window **Figure 2.5i Network Configuration Windows XP**

NOTE
You must not configure more than one computer with the same host name. This creates conflict in the network.

NOTE
The IP address of your DNS Server should be provided by your ISP. If you are still not sure about it, please contact your ISP.

6. Press the **OK** button again to close the network configuration window. The Microsoft Windows will then prompt you to restart the computer. Press the **OK** button to reboot.

Chapter 3 Configuring Compex NetPassage 16A

This chapter explains the features of Compex NetPassage 16A in sections and how to implement them.

3.1 Setting up your LAN

Compex NetPassage 16A is pre-configured with a default IP address **192.168.168.1** with a network mask of **255.255.255.0**. By default, the DHCP Server has also been pre-configured to assign IP addresses starting from **192.168.168.100** to **192.168.168.254**. If you do not wish to use these for your network, you may change these settings. You may also wish to specify another IP address as a default gateway in the DHCP releases. If the DHCP Gateway IP Address is set to 0.0.0.0, the DHCP server will automatically assigns Compex NetPassage 16A as the default gateway.

3.1.1 Configuring IP Addressing

If you wish to modify the IP addressing of your Compex NetPassage 16A, you may do so in the web-based configuration interface.

1. Log on to the web-based configuration interface of Compex NetPassage 16A with a web browser.

2. Click on the **LAN Setup** from the Command Menu and the LAN setup window shall appear, as shown in Figure 3.1a.

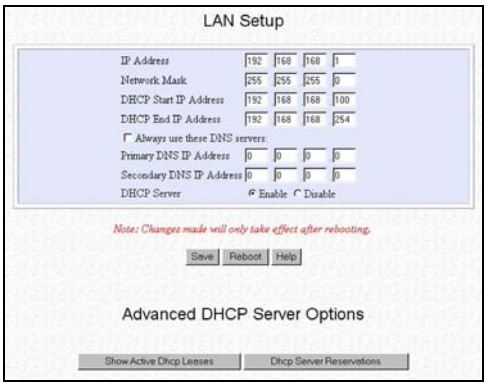

LAN Setup
IP Address 192 168 168 1
Network Mask 255 255 255 0
DHCP Start IP Address 192 168 168 100
DHCP End IP Address 192 168 168 254
Always use these DNS servers:
Primary DNS IP Address 0 0 0 0
Secondary DNS IP Address 0 0 0 0
DHCP Server Enable Disable
Note: Changes made will only take effect after rebooting.
Save Reboot Help
Advanced DHCP Server Options
Show Active Dhcp Leases
Dhcp Server Reservations

Figure 3.1a LAN Setup

3. Fill in the parameters in the respective text boxes as shown on the following page:

IP Address	This is the IP address of your Compex NetPassage 16A
Network Mask	This is the Network Mask of your Compex NetPassage 16A's IP address. It decides the subnet of your Compex NetPassage 16A. For example, if the IP address and network mask of your Compex NetPassage 16A are 192.168.168.1 and 255.255.255.0 respectively, the subnet of your Compex NetPassage 16A is 192.168.168.0.
DHCP Start IP Address	This is the first IP address where the built-in DHCP server of Compex NetPassage 16A assigns. It should be in the same subnet as your Compex NetPassage 16A. For example, if the IP address and network mask of your Compex NetPassage 16A is 192.168.168.1 and 255.255.255.0 respectively, the DHCP Start IP Address should be 192.168.168.X, where X is (1-254)
DHCP End IP Address	This is the last IP address where the built-in DHCP server of Compex NetPassage 16A assigns. It should be in the same subnet as your Compex NetPassage 16A. For example, if the IP address and network mask of your Compex NetPassage 16A is 192.168.168.1 and 255.255.255.0 respectively, the DHCP End IP Address should be 192.168.168.X, where X is (1-254)
DHCP Gateway IP Address	The DHCP Server will automatically assigned a Gateway IP Address the PC connected in the same network.
Always use these DNS servers	This checkbox is associated with the built-in DHCP Server of Compex NetPassage 16A. If this box is "checked", the built-in DHCP Server will configure the DNS information of the computers. If this box is NOT "checked", you need to manually configure the DNS information in every computer in the network.

Primary DNS IP Address	If the Always use these DNS servers checkbox is "checked", fill in an IP address of a DNS server. This information is normally provided by your ISP.
Secondary DNS IP Address	This field contains the IP address of a secondary DNS server (optional)
DHCP Server	Enable or disable the DHCP server. If you disable the DHCP server, you need to manually configure the TCP/IP of every computer in the network.

4. Press the **Save** button followed by **Reboot** button to complete the process.

3.1.2 Advanced Option for DHCP Server

You may configure the built-in DHCP Server of Compex NetPassage 16A to release a specific IP address to a specific computer via the web-based configuration interface. You may also view the IP releases online.

To reserve IP addresses for specific computers

1. Press the **DHCP Server Reservations** button from the LAN Setup window shown in Figure 3.1a. The configuration window for DHCP server reservation will be displayed.

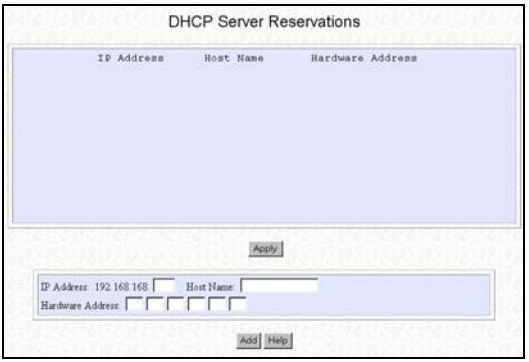


Figure 3.1b DHCP Server Reservations

2. Specify the reserved **IP Address**, the **Host Name** or the **Hardware Address** in the respective text boxes:

IP Address	This is the reserved IP address for a specific computer
Host Name	This is the host name of the computer
Hardware Address	This is the hardware MAC address of the Ethernet interface of the computer

NOTE
The reserved IP address must not be within the range of DHCP start and end IP addresses.

3. Press the **Add** button to add this entry, and the **Apply** button to make it effective.

To view the IP released by the DHCP Server

1. Press the **Show Active Dhcp Leases** button in the LAN Setup window shown in Figure 3.1a. The list of released IP addresses will be displayed, as shown in Figure 3.1c.

Figure 3.1c DHCP Server Reservations

NOTE
Invalid date and time shown under **Expires** column indicates that the router's clock of your Compex NetPassage 16A has not been set. Refer to Section 3.14.2 on how to set the router's clock.

3.2 Configuring Compex NetPassage 16A with your Broadband Internet Account

Compex NetPassage 16A shares a single Cable or ADSL Internet account with multiple computers in the network. It supports these broadband Internet connections with different types of WAN protocol. This includes Dynamic IP, Static IP and PPP over Ethernet (PPPoE). Compex NetPassage 16A has also been customized to support Big Pond Cable Internet in Australia and Singtel Magix SuperSurf in Singapore. Successful configuration of Compex NetPassage 16A to work with your broadband Internet account requires you to identify the type of broadband Internet connection you have subscribed. Refer to the following to select the correct WAN type for your broadband Internet subscription.

If you have subscribed to Cable Internet of which your ISP dynamically assigns IP address to you, please go to **Section 3.2.1** titled **Cable Internet with Dynamic IP Assignment**.

If you have subscribed to Cable Internet of which your ISP provides you with an IP or a range of IP addresses, please go to **Section 3.2.2** titled **Cable Internet with Static IP Assignment**.

If you have subscribed to ADSL Internet that requires standard PPP over Ethernet (PPPoE) for authentication, please go to **Section 3.2.3** titled **ADSL Internet using PPPoE**.

If you are a subscriber of Singtel Magix SuperSurf in Singapore, please go to **Section 3.2.4** titled **Singapore Singtel Magix SuperSurf**.

If you are a subscriber of Big Pond Cable Internet in Australia, please go to **Section 3.2.5** titled **Australia Big Pond Cable Internet**.

If you have subscribed to Point to Point Tunneling Protocol, please go to **Section 3.2.6** titled **Point to Point Tunneling Protocol**.

You may find some important information concerning the broadband ISP in your country in Appendix B of this User's Manual.

3.2.1 Cable Internet with Dynamic IP Assignment

By default, Compex NetPassage 16A is pre-configured to support a WAN type that dynamically obtain an IP address from the ISP. If you have subscribed to Cable Internet of which your ISP dynamically assign an IP address, you do not need to configure the WAN type.

However, there are exceptional cases where additional configuration is required before an IP address is successfully obtained from the ISP:

Certain ISPs log the MAC address of the first device connected to the broadband channel, and refuse to release an IP address unless the MAC address matches the one in the log. If this is not a new Cable Internet subscription and that the ISP refuses to release an IP address to you, you may clone the "approved" MAC address to Compex NetPassage 16A. Refer to the paragraph titled **Cloning MAC Address to Compex NetPassage 16A** in this section.

Certain ISPs requires a DHCP Client ID to be authenticated before releasing an IP address. To successfully obtain an IP address from such ISPs, you need to configure Compex NetPassage 16A with a DHCP Client ID. Compex NetPassage 16A uses **Router Identity** as the DHCP Client ID to request for IP release. Refer to **Section 3.14.1** titled **Setting Router Identity**.

If your Compex NetPassage 16A has previously been configured with other WAN type, you may re-configure it to support Cable Internet with Dynamic IP Assignment.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed, as shown in Figure 3.2a.

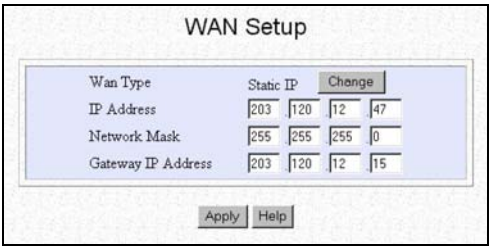


Figure 3.2a Changing WAN Type

NOTE
Figure 3.2a shows a WAN interface configured with static IP. If your Compex NetPassage 16A has previously configured with PPPoE or other WAN type, this page will show the respective configuration page.

2. Press the **Change** button and the list of supported WAN type will be displayed, as shown in Figure 3.2b.

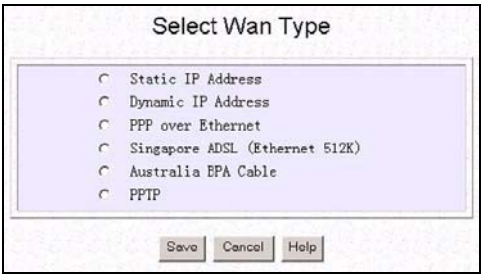


Figure 3.2b WAN Type - Dynamic IP Address

3. Check the **Dynamic IP Address** radio button and press the **Save** button.

4. Press the **Reboot** button to restart Compex NetPassage 16A.

Cloning MAC Address to Compex NetPassage 16A

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed as shown.

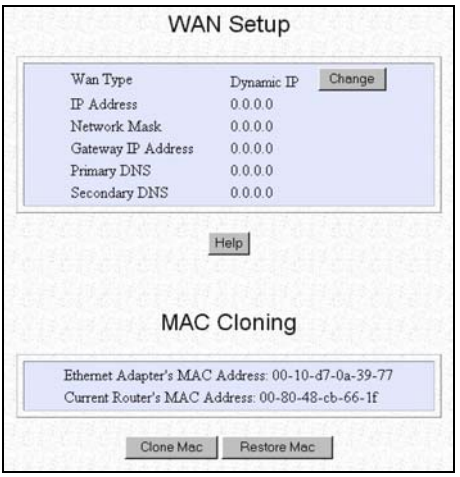


Figure 3.2c Cloning MAC Address

2. Press the **Clone Mac** button to clone the MAC address of your managing computer to Compex NetPassage 16A. The configuration interface will then prompt you to reboot the router. Press the **Reboot** button to restart your Compex NetPassage 16A.

3.2.2 Cable Internet with Static IP Assignment

Certain ISPs lease a static IP for their Internet subscriptions. For such Cable Internet subscription, you need to configure the WAN interface of Compex NetPassage 16A with static IP address.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed.

Figure 3.2d Changing WAN Type

2. Press the **Change** button and the list of supported WAN type will be displayed as shown.

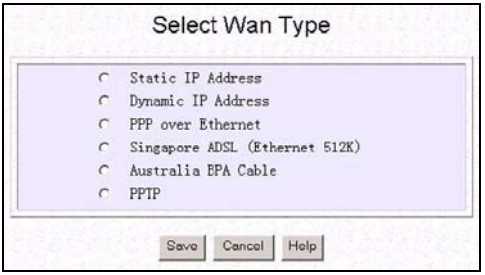


Figure 3.2e WAN Type – Static IP Address

3. Check the **Static IP Address** radio button and press the **Save** button. The following Static IP Configuration page will then be displayed.

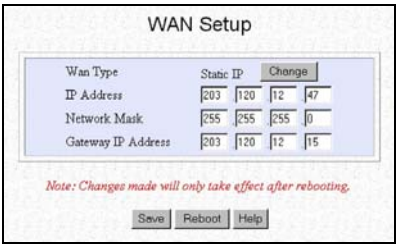


Figure 3.2f Static IP Configuration Page

4. Enter the **IP Address**, the **Network Mask** and the ISP's **Gateway IP Address** into the fields. These information is provided by your ISP. Press the **Save** button followed by the **Reboot** button to complete the configuration process.

3.2.3 ADSL Internet using PPP over Ethernet (PPPoE)

If you have subscribed to ADSL Internet service using standard PPP over Ethernet (PPPoE) for authentication, you need to configure your Compex NetPassage 16A to support PPPoE.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed, as shown in Figure 3.2a.

2. Press the **Change** button and the list of supported WAN type will be displayed.

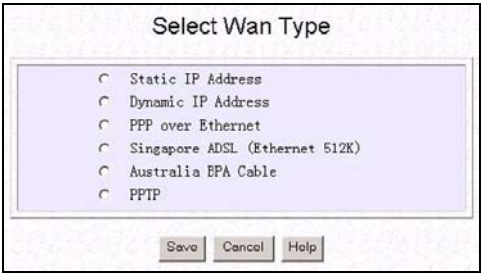


Figure 3.2g WAN Type – PPP over Ethernet

3. Check the **PPP over Ethernet** radio button and press the **Save** button. The PPPoE Configuration page will then be displayed.

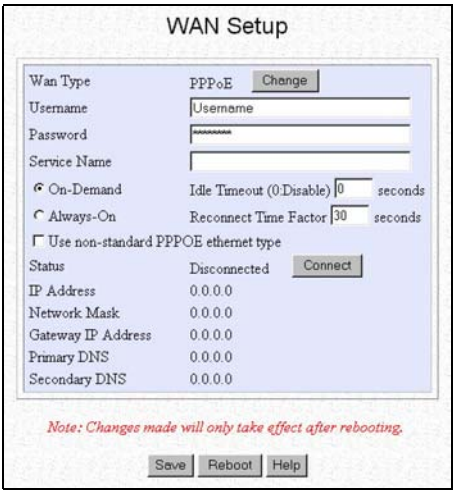


Figure 3.2h PPPoE Configuration Page

4. Fill in the parameters for your ADSL Internet service:

Username	Enter the username of your ADSL Internet subscription in this field
Password	Enter the password of the username
Service Name	Enter the service name of your ADSL Internet subscription (optional)
On-Demand	When this box is "checked", your Compex NetPassage 16A will automatically connect to the ISP when an Internet request is present in the network.
Idle Timeout	This field is associated with On-Demand option. This field allows you to specify the idling timeout value for Compex NetPassage 16A to disconnect from the ISP. "0" value in this field disables idling timeout function. When set to "0", Compex NetPassage 16A remains connected unless

	disconnected by the ISP. Once disconnected, Compex NetPassage 16A will stay offline until the next Internet request is detected in the network.
Always-On	When this box is "checked", your Compex NetPassage 16A will always connect to the ISP, with and without Internet requests.
Reconnect Time Factor	This field is associated with Always-On option. This field allows you to specify a Reconnect Time Factor (RTF). The default value is 30 seconds. If Always-On option is selected with an RTF of 30 seconds, your Compex NetPassage 16A will stay connected to the ISP even when there is no Internet traffic present. If disconnected by the ISP, Compex NetPassage 16A will perform a delay for a random period between 1 to RTF seconds (for RTF value of 30, the random period is drawn between 1 to 30 seconds), and reconnect to the ISP.
Use non-standard PPPOE Ethernet type	Certain Ethernet-based ADSL modem requires non-standard PPP over Ethernet for authentication. If you are uncertain about this, DO NOT "check" this box.

5. Press the **Save** button followed by the **Reboot** button to complete the configuration process.

3.2.4 Singapore SingTel Magix SuperSurf

You should use this WAN type only if you are a subscriber of SingTel Magix SuperSurf in Singapore. If you have subscribed to SingNet Broadband or Pacific Internet Broadband, please go to **Section 3.2.3** titled **ADSL Internet using PPP over Ethernet (PPPoE)**.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed, as shown in Figure 3.2a.

2. Press the **Change** button and the list of supported WAN type will be displayed.

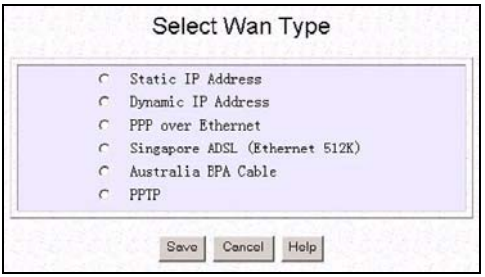


Figure 3.2i WAN Type – Singapore ADSL

3. Check the **Singapore ADSL (Ethernet 512K)** radio button and press the **Save** button. The configuration page for SingTel Magix SuperSurf will be displayed as shown below.

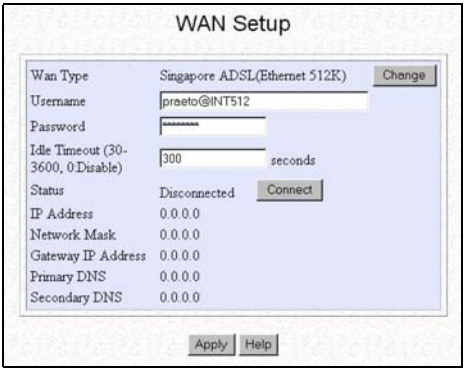


Figure 3.2j SingTel Magix SuperSurf Configuration Page

4. Enter the **Username**, **Password** and **Idling Timeout** value to the fields and press the **Save** button.

5. Press the Reboot button to complete the configuration process.

3.2.5 Australia Big Pond Cable Internet

You should select this WAN type only if you are a subscriber of Big Pond Cable Internet in Australia. If you have subscribed to OPTUS in Australia, please go to **Section 3.2.1** titled **Cable Internet with Dynamic IP Assignment**. Please take note that OPTUS requires a DHCP Client ID before releasing an IP address to you.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed, as shown in Figure 3.2a.

2. Press the **Change** button and the list of supported WAN type will be displayed as shown below.

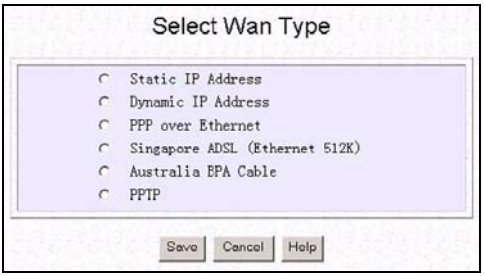


Figure 3.2k WAN Type – Australia BPA Cable

3. Check the **Australia BPA Cable** radio button and press the **Save** button. The configuration page for Big Pond Australia will be displayed.

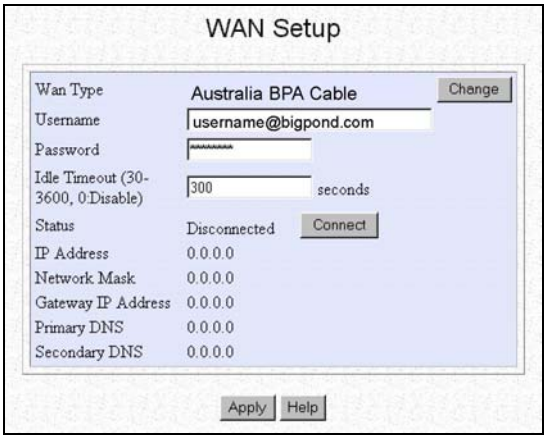


Figure 3.2l Big Pond Australia Configuration Page

4. Enter the **Username**, **Password** and **Idling Timeout** to the fields and press the **Save** button.

5. Press the **Reboot** button to complete the configuration process.

3.2.6 Point to Point Tunneling Protocol (PPTP)

PPTP enables implementation of secure, multi-protocol Virtual Private Networks (VPNs) through public data networks, such as Internet or PPTP.

1. Click on the **WAN Setup** from the Command Menu and the WAN configuration page will be displayed, as shown in Figure 3.2a.

2. Press the **Change** button and the list of supported WAN type will be displayed as shown below.

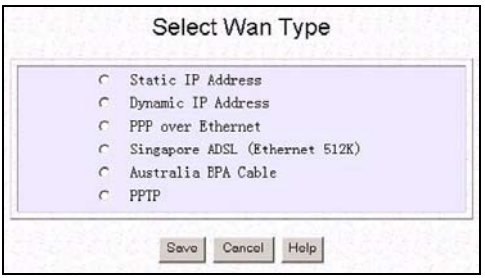


Figure 3.2m WAN Type – PPTP

3. Check the **PPTP** radio button and press the **Save** button. The configuration page for **PPTP** will be displayed.

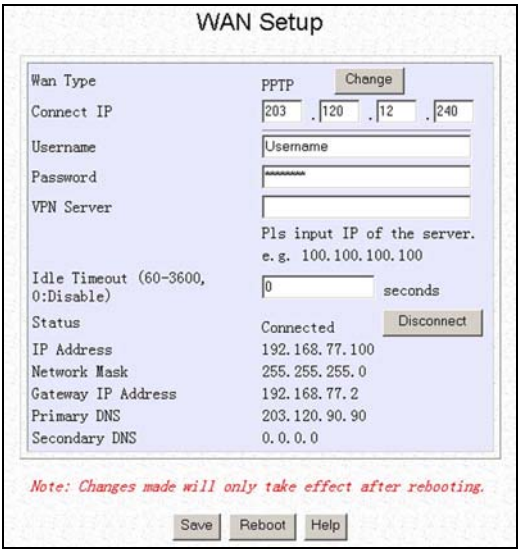


Figure 3.2n Configuration on PPTP

4. Fill in the parameters for your PPTP service:

Connect IP	Key in the IP Address of your Service Provider.
Username	Enter the username of your PPTP subscription.
Password	Enter the password of the username.
VPN Server	Enter the IP Address for VPN server.
Idle Timeout	This field allows you to specify the idling timeout value for Compex NetPassage 16A to disconnect from the ISP. “0” value in this field disables idling timeout function. When set to “0”, Compex NetPassage 16A remains connected unless disconnected by the ISP. Once disconnected, Compex NetPassage 16A will stay offline until the next Internet request is detected in the network.

5. Press the **Save** button followed by the **Reboot** button to complete the configuration process.

6. Enter all necessary information in the individual fields and press the **Save** button.

7. Press the **Reboot** button to complete the configuration process.

3.3 Network Address Translator (NAT)

Compex NetPassage 16A has been designed with a Network Address Translator (NAT) that supports Port Address Translation (PAT), sharing a single public IP address with multiple computers in the private network by using different TCP ports for different computers. By default, the NAT is enabled.

CAUTION
Disabling the NAT will cause your computers not being able to share the broadband Internet service. DO NOT disable the NAT unless you are certain on what you are doing.

Due to the translation, the computers behind the NAT are not reachable from the Internet. However, with the support of Virtual Server, you may host the Internet servers behind the NAT based on Port Forwarding or IP Forwarding.

3.3.1 Introduction to Virtual Servers

Compex NetPassage 16A supports two types of Virtual Server, one based on Port Forwarding and the other based on IP Forwarding, where IP Forwarding option is only available when the WAN interface of Compex NetPassage 16A has been configured with a static IP.

Virtual Server based on Port Forwarding

When Virtual Server based on Port Forwarding is implemented, Internet requests to the IP address of Compex NetPassage 16A's WAN interface will be forwarded to a specific computer in the private network based on the TCP port of the Internet request. Refer to Figure 3.3a.

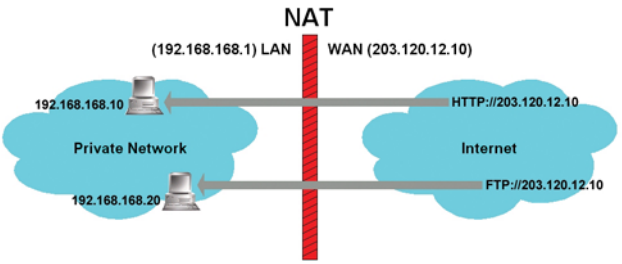


Figure 3.3a Virtual Server based on Port Forwarding

Figure 3.3a shows two Virtual Servers implemented, HTTP Virtual Server and FTP Virtual Server. To implement the Virtual Server, you need to know the TCP port that the intended application is using.

For example, suppose that your ISP has assigned an IP address of 203.120.12.10 to your Compex NetPassage 16A, and you wish to host a web server in your private network on a computer with an IP address of 192.168.168.10; you need to define a Virtual Server at TCP Port 80 (used by HTTP by default) to be forwarded to 192.168.168.10. Once implemented, all "http://203.120.12.10" requests will be forwarded to the computer with 192.168.168.10 IP address. If you wish to host another FTP server in your private network on a computer with an IP address of 192.168.168.20; you will then need to define a Virtual Server at TCP Port 21 (used by FTP by default) to be forwarded to 192.168.168.20.

Virtual Server based on IP Forwarding

If you have subscribed to a range of IP addresses from your ISP, you may also define Virtual Servers based on IP Forwarding. This type of Virtual Server forwards all Internet requests, regardless of the TCP port of the application, to a computer in the private network. Refer to Figure 3.3b.

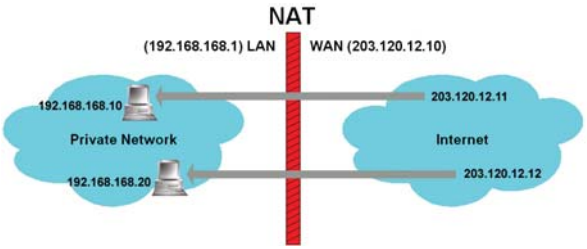


Figure 3.3b Virtual Server based on IP Forwarding

Figure 3.3b shows two Virtual Servers based on IP Forwarding. One maps the public IP 203.120.12.11 to private IP 192.168.168.10, and the other maps the public IP 203.120.12.12 to private IP 192.168.168.20.

3.3.2 Defining Virtual Server based on De-Militarized Zone (DMZ)

Due to the nature of Network Address Translator (NAT), the subnet behind the NAT cannot be reached from the Internet. If you know the TCP/UDP port of an application, such as HTTP, you can easily define a Virtual Server based on Port Forwarding behind the NAT to support a Web Server in your private subnet. However, if you are uncertain on the TCP/UDP port used by an application (certain Internet games), or an application utilizes varying TCP/UDP port, you may define a DMZ host of which Compex NetPassage 16A will direct all the unresolved Internet requests to.

For example, if the WAN interface of Compex NetPassage 16A has been assigned an IP address of 203.120.12.20 and you have defined a DMZ host with IP address of 192.168.168.10, all the unresolved Internet requests to 203.120.12.20 will be forwarded to 192.168.168.10, regardless of the TCP/UDP port.

To define a DMZ host

1. Click on the **NAT** from the Command Menu and the NAT configuration page will be displayed as shown below.

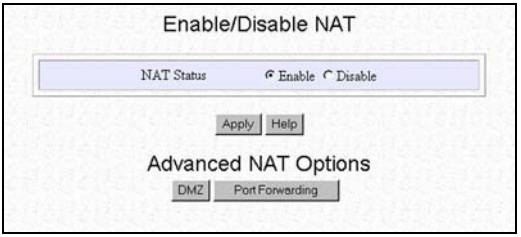


Figure 3.3c NAT Configuration Page

2. Press the **DMZ** button and the following DMZ Host Definition Window will be displayed.

Figure 3.3d Configuring DMZ

3. Enter the IP address of the your designated computer and press the **Apply** button.

4. Save the configuration profile.

NOTE
To disable DMZ, please enter the IP address as 0.0.0.0.

3.3.3 Defining Virtual Server based on Port Forwarding

To define Virtual Server based on Port Forwarding:

1. Click on the **NAT** from the Command Menu and the NAT configuration page will be displayed, as shown in Figure 3.3c.

2. Press the **Port Forwarding** button and the list of defined Virtual Server will be displayed, as shown in Figure 3.3e.

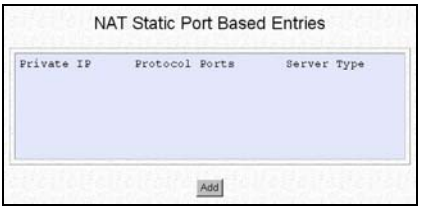


Figure 3.3e Table Showing Defined Virtual Server based on Port Forwarding

3. Press the **Add** button to define new Virtual Server as shown below.

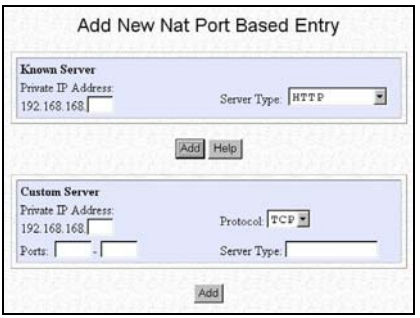


Figure 3.3f Defining New Virtual Server based on Port Forwarding

4. For **Known Server**, select the **Server Type** from the drop down menu and specify the private IP address of your Virtual Server.

5. For **Custom Server**, specify the IP address of the Virtual Server, select the **Protocol** used by this application from the drop down menu, specify the TCP/UDP port used by this application, and enter your preferred reference name in the **Server Type** field.
6. Press the **Add** button to add this new Virtual Server into the list.

7. Press the **Save or Reset Settings** from the Command Menu and press the **Save** button.

3.3.4 Defining Virtual Server based on IP Forwarding

If you have configured your Compex NetPassage 16A with Static IP WAN type, you have the option to define Virtual Server based on IP Forwarding.

1. Click on the **NAT** from the Command Menu and the NAT configuration page will be displayed as shown below.

Figure 3.3g NAT Configuration Window for Static IP WAN Type

2. Press the **Static Ip Address Entries** button and the list of defined Virtual Server will be displayed, as shown in Figure 3.3h.

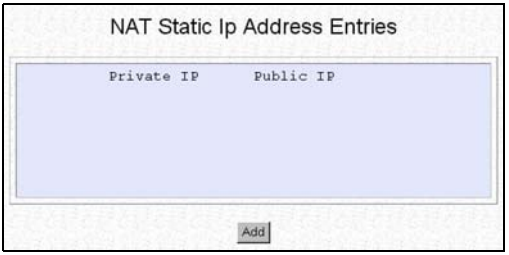


Figure 3.3h Table Showing Defined Virtual Server based on IP Forwarding

3. Press the **Add** button to define new Virtual Server as shown.

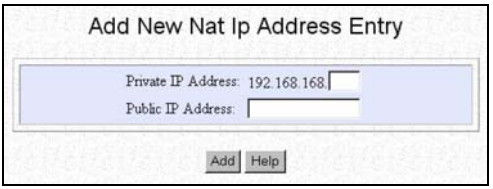


Figure 3.3i Defining New Virtual Server based on IP Forwarding

4. Enter the **Public IP Address** and the **Private IP Address** which it maps to. Please ensure that you have subscribed to this **Public IP Address**.

5. Press the **Add** button to add this new Virtual Server into the list.

6. Click on the **Save or Reset Settings** from the Command Menu and press the **Save** button.

3.4 Static Address Translation (SAT)

If you are a notebook user, it is probably very often that you connect to the Internet at your home to retrieve emails or surf the Internet. Static Address Translation function that allows your notebook computer to connect to the Internet even if it is NOT configured with the same subnet as Compex NetPassage 16A's.

For example, if Compex NetPassage 16A is configured with a Class C IP of 192.168.168.1 and your notebook is configured with Class C IP of 203.120.12.47, you may access to the broadband Internet via Compex NetPassage 16A without the need of reconfiguring the TCP/IP of your notebook. By default, this feature is disabled.

NOTE
If you are unsure whether to activate the SAT functionality, please disable this function.

We at Compex always provide updated firmware on our website at www.compex.com.sg. Constantly check to see if you have the updated firmware.

3.4.1 Enable/disable Static Address Translation

1. Click on **Static Address Translation** option from the Command Menu and the following window shall be displayed.

Figure 3.4a Static Address Translation

2. Press the **Enable** or **Disable** radio button to enable/disable this feature.
3. Press the **Apply** button for the changes to be affective.
4. Save the configuration.

3.5 DNS Redirection

Compex NetPassage 16A enables you to access to the internet without knowing the IP Address of DNS server. You can simply key in any legal IP Address in the field of the TCP/IP Properties window such as 10.10.10.10. Please refer to the figures shown below:

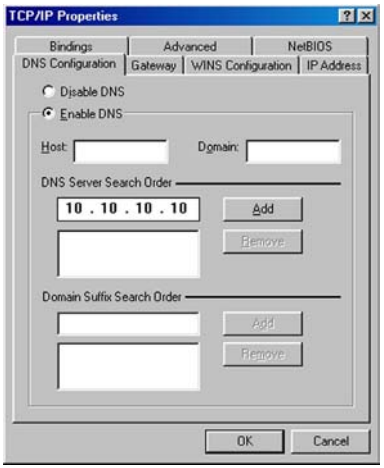


Figure 3.5a TCP/IP for Window 95/98

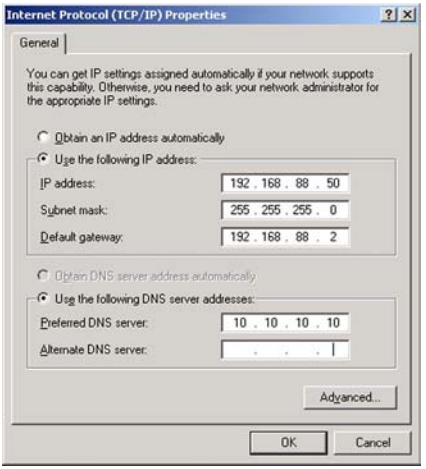

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
192 . 168 . 88 . 50
Subnet mask:
255 . 255 . 255 . 0
Default gateway:
192 . 168 . 88 . 2
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
10 . 10 . 10 . 10
Alternate DNS server:
Advanced...
OK
Cancel

Figure 3.5b TCP/IP for Window 2000

Click on the **Enabled** radio button followed by **Apply** button as shown below.

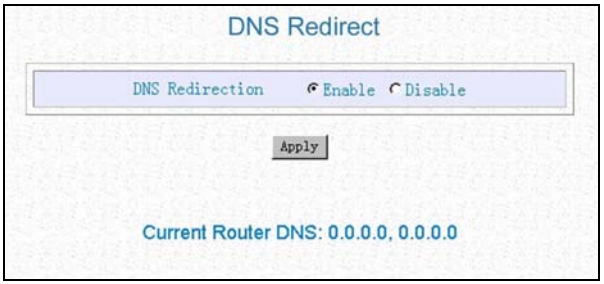


Figure 3.5c DNS Redirection

Now, you can easily surf the net without worries.

NOTE
If you set the IP Address of your PC to dynamic, enabling the DNS Redirection function will not be activated.

CAUTION
You should not leave the DNS Server field in the TCP/IP Properties window blankly or the router will not be able to assign an IP Address to your PC. And this leads to inaccessible to the internet.

3.6 Configuring Routing Protocol

Compex NetPassage 16A allows the network administrator to add a static routing entry into the routing table. Other than the default gateway to the Internet, Compex NetPassage 16A may reroute the IP packets to another network. This is very useful for a network with more than one router.

CAUTION
If you are configuring Compex NetPassage 16A for broadband Internet sharing, you DO NOT need to configure any routing information. The default routing settings of Compex NetPassage 16A are sufficient for broadband Internet sharing. Improper routing configuration will cause undesired effect.

For example, if you have two routers in the network, where one functions as an Internet gateway and the other as a gateway to a remote office. You may define a static route in Compex NetPassage 16A to re-route the packets to the remote office. Refer to Figure 3.6a.

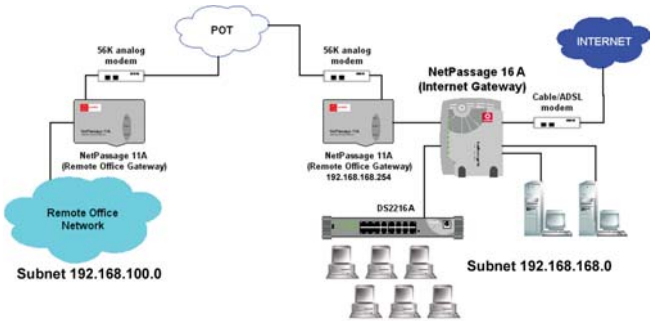


Figure 3.6a Network with multiple gateways. One to the Internet and the other to the remote office.

In this network, the main office of subnet 192.168.168.0 contains two routers, one connected to the broadband Internet via Compex NetPassage 16A (IP 192.168.168.1) and the other connected to a remote office via NetPassage 11A (IP 192.168.168.254). The remote location resides on subnet 192.168.100.0. You may add a static routing entry into Compex NetPassage 16A's routing table to point the gateway 192.168.168.254 to subnet 192.168.100.0. Once added, packets with destination IP address of 192.168.100.X will be re-routed to NetPassage 11A (IP 192.168.168.254).

Alternatively, you may also activate dynamic routing protocol on Compex NetPassage 16A. Compex NetPassage 16A supports two types of routing protocol, RIP1 and RIP2.

3.6.1 Static Routing

To add a static routing entry into Compex NetPassage 16A's routing table:

1. Click on the **Routing** from the Command Menu, and the routing configuration page will be displayed, as shown in Figure 3.6b.

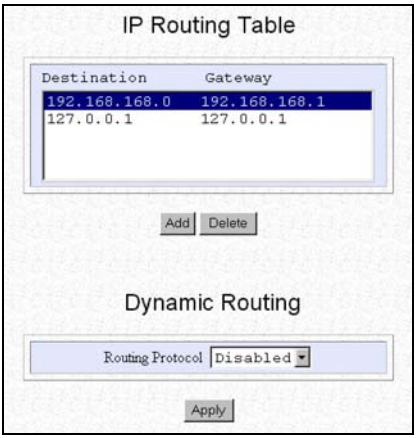


Figure 3.6b Routing Configuration Page

2. To define a new static routing entry into the routing table, press the **Add** button. The following page will be displayed, as shown in Figure 3.6c.

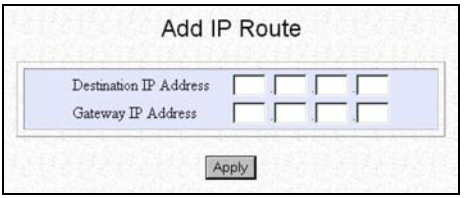


Figure 3.6c Adding New Static Routing Entry into the Routing Table

3. Enter the destination network address into the **Destination IP Address** field and the IP address of the gateway connected to this network into the **Gateway IP Address** field. For example if a gateway of IP 192.168.168.254 is connected to a remote network 192.168.100.0, enter the **Destination IP Address** and **Gateway IP Address** as 192.168.100.0 and 192.168.168.254 respectively.

4. Press the **Apply** button to add the new static routing entry into Compex NetPassage 16A's routing table.

3.6.2 Dynamic Routing

To enable dynamic routing protocol:

1. Click to expand the **Dynamic Routing** drop down menu and select the preferred dynamic routing protocol, RIP1 or RIP2. (Figure 3.6b)

2. Press the **Apply** button for the changes to be effective.

3.7 Managing Compex NetPassage 16A from the Internet

Compex NetPassage 16A is integrated with an HTTP Server, enabling router management from the private network with just a JAVA-enabled web browser. It may also be managed via a Command Console. In addition, Compex NetPassage 16A supports Remote Router Management, allowing the network administrators to manage the router from the Internet, either by a web browser or via a TELNET session.

3.7.1 Activating Remote Router Management

To activate Remote Router Management from the Internet:

1. Click on the **Remote Management** from the Command Menu and the remote management activation page will be displayed, as shown below.

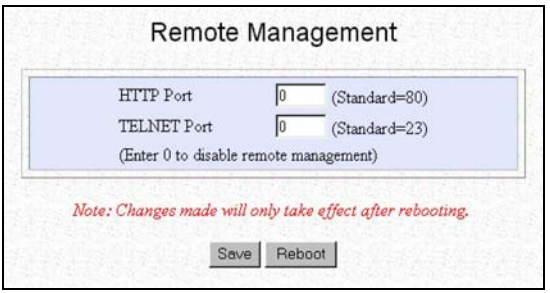


Figure 3.7a Activating Remote Router Management

2. Enter the desired TCP port that you wish to use for Remote Router Management. Default value of "0" disables this feature.

HTTP Port Specify the desired port for remote router management via a web browser. If you have specified a non-standard TCP port for this field, you need to specify the port number when you connect to the management interface from the Internet.

For example, if your ISP has assigned 203.120.12.30 to Compex NetPassage 16A's WAN interface and you have chosen to use port 2000 for HTTP remote management, you may connect to the router management interface by using http://203.120.12.30:2000.

TELNET Port

Specify the desired port for remote router management via a TELNET session (Command Console). If you have specified a non-standard TCP port for this field, you need to specify the port number when you connect to the command console from the Internet.

For example, if your ISP has assigned 203.120.12.30 to Compex NetPassage 16A's WAN interface and you have chosen to use port 5000 for TELNET remote console management, you may connect to the router command console by TELNET to port 5000 of 203.120.12.30

3. Press the **Save** button followed by the **Reboot** button to complete the process.

3.8 Load Balancing & Fail-Over Redundancy with Parallel Broadband

Designed with the unique **Parallel Broadband** technology, Compex NetPassage 16A provides scalable Internet bandwidth with Load Balancing and Fail-Over Redundancy. If multiple units of Compex NetPassage 16A are installed in the network, the Internet traffic will be balanced across multiple broadband channels, delivering virtually a combined aggregated bandwidth while functioning as Fail-Over Redundancy.

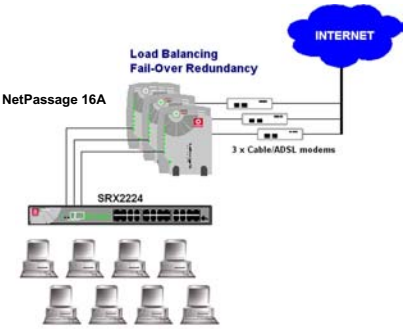


Figure 3.8a Parallel Broadband with Multiple Broadband Channels

3.8.1 Implementing Parallel Broadband

To implement Parallel Broadband, you need to install two or more units of Compex NetPassage 16A in the network, each connected to its broadband Internet service account. There is no restriction on the type of broadband Internet accounts that they are connected to. For example, if you have two Compex NetPassage 16As in the network, you may have one connected to Cable Internet whereas the other connected to ADSL line. Once the Parallel Broadband is implemented, these two Compex NetPassage 16As will balance the Internet traffic among them while functioning as Fail-Over Redundancy to each other.

To activate Parallel Broadband

1. Click on the **Parallel Broadband** from the Command Menu and the Parallel Broadband activation page will be displayed as shown.

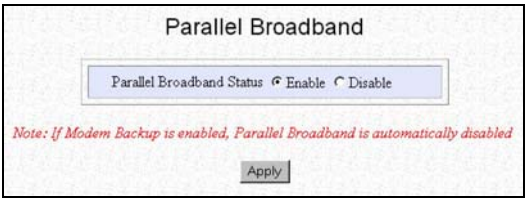

Parallel Broadband
Parallel Broadband Status Enable Disable
Note: If Modem Backup is enabled, Parallel Broadband is automatically disabled
Apply

Figure 3.8b Activating Parallel Broadband

2. Check the **Enable** radio button and press the **Apply** button.

NOTE
You DO NOT need to implement Parallel Broadband for Internet sharing using one unit of Compex NetPassage 16A.

3.9 56K analog Dial-Up/ISDN Modem as Backup Link

An external V.90 56K analog/ISDN modem (selective) may be connected to the RS232 serial port of Compex NetPassage 16A, utilizing a 56K or ISDN modem dial-up Internet account as the backup link to the Internet. In case of down time of your broadband ISP, Compex NetPassage 16A will automatically establish a backup Internet connection via the 56K or ISDN modem dial-up access.

3.9.1 Setting Up 56K Dial-Up Access/ISDN Modem as Backup Link

To setup an external V.90 56K analog/ISDN modem as the backup link to the Internet,

1. Connect an external V.90 56K analog/ISDN modem to your Compex NetPassage 16A and connect the telephone wire into it.

2. Click on **Modem Backup** from the Command Menu and the V.90/ISDN modem Backup configuration page will be displayed.

Figure 3.9a Configuring 56K Analog/ISDN Modem Back-Up Connection

3. Click on the “Change” button to switch between the options of Direct and Backup modem. The following GUI will appear.

Figure 3.9b Select the types of modem

4. Select the radio button of either Direct or Backup Modem and hit on **Apply** button.

5. Next, check the **Enable** radio button, choose the **Modem Type**, enter the dial-up **Phone number**, the **Username** & **Password**, and the **Modem Init String** in the text box. Specify the preferred **Idle Timeout** and press the **Save** button.

6. Reboot your device.

3.10 Firewall Configuration

Compex NetPassage 16A is specially designed with firewall function to prevent unauthorized access to or from the network. All messages entering or leaving Compex NetPassage 16A will pass through the firewall. It will then examines each message and blocks those that do not meet the specified security criteria. The firewall can be activated by purchasing an activation key from www.compex.com.sg or www.cpx.com website.

Compex NetPassage 16A uses Packet Filtering and Static inspection methods to control the traffic flowing in and out of the network. This is much better than a normal firewall. The packets that make it through the filters are sent to the requesting system and the rest are discarded. Static inspection compares certain key parts of the packet to a database of trusted information. All information that travels through the firewall is monitored for specified defining characteristics, and the incoming information is compared to these characteristics. If the comparison matches, the information is allowed to pass through, otherwise, it is discarded. SPI Firewall is unlike the normal firewall that only checks the headers of the packets, it also scrutinize the contents of the packets, ensuring the integrity of the packets.

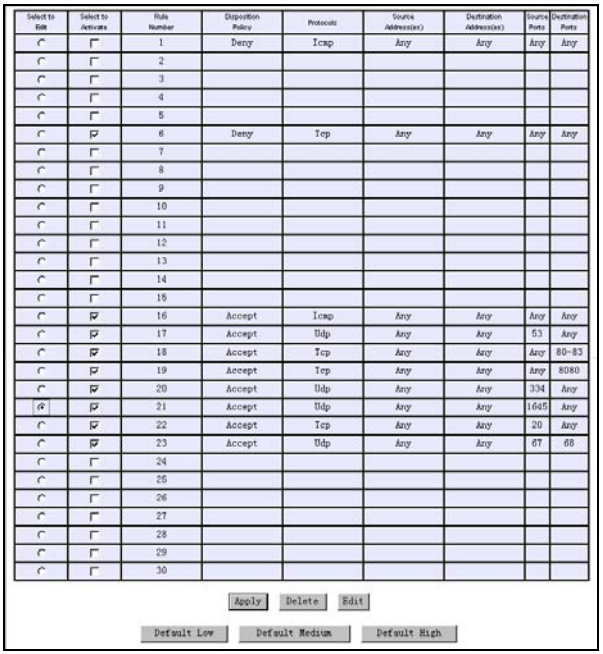


Figure 3.10a Configuration on Firewall

Security level

The level of security that you have chosen (low, medium, high) will determine how many of these threats can be stopped by firewall. The highest level of security would be to simply block almost everything. You can restrict the traffic flows through the firewall so that only certain information, such as email, can get through.

Log Information

Different protocols served differently for filtering purposes:

TCP (Transport Control Protocol) is used to rebuild information that travels over the Internet.

UDP (User Datagram Protocol) is used for the information that requires no response, such as streaming audio and video.

ICMP (Internet Control Message Protocol) is used by Compex NetPassage 16A to exchange the information with other routers.

IGMP (Internet Group Management Protocol) is used to establish host memberships in particular multicast groups on a single network.

If you select any of packets from the **Accepted** section, these received packets which has passed the filtering rules will be displayed in the firewall log section – figure 3.11a. This also applies to the **Denied** section.

Adding Firewall Rules

If you wish to add in more rules for security purposes, simply,

1. Click on **Add** button and the following GUI will appear.

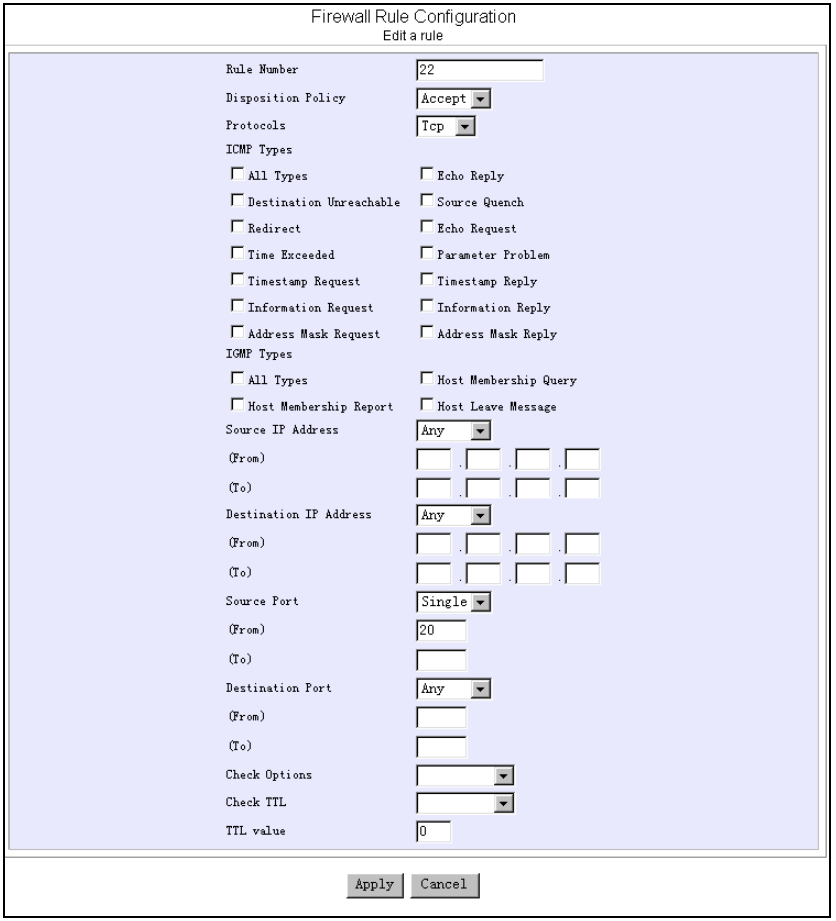


Figure 3.10b Firewall Rule configuration

2. After entering your preference entry to individual field, hit on the **Apply** button to confirm the rules configuration.

3.11 Firewall Log

This Firewall log displays all necessary information such as the reasons on why the packets are being accepted or discarded. The log will also inform you about the attack on UDP flooding or SYN flooding.

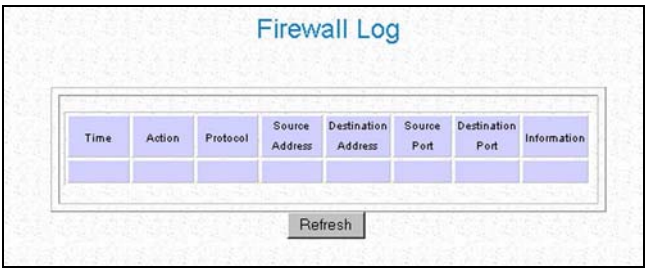


Figure 3.11a Firewall Log

Click on **Refresh** button to update the latest information.

3.12 IP Packet Filtering

Compex NetPassage 16A enables the users to define administrative functions based on packet filtering rule. With IP packet filtering, you may perform **Time-based Access Management** and **Internet Application Filtering**.

Time-based Access Management selectively allow or disallow certain computers in the network to access to the Internet in different time frame. For example, you may define a function to allow your children to access to the Internet only between 8:00PM to 10:00PM.

Internet Application Filtering selectively allow/disallow certain application to connect to the Internet. For example, if you wish to allow only web browsing in the network, you may define a function to allow only HTTP protocol to pass through Compex NetPassage 16A.

3.12.1 Time-based Access Management

To define a function for Time-based Access Management:

1. Before proceeding to define a function for **Time-based Access Management**, ensure that your Compex NetPassage 16A's router clock has been synchronized with your computer. Refer to **Section 3.14.2** titled **Synchronizing Router's Clock with your Computer** on how to synchronize the router's clock.

2. Click on the **Filtering** from the Command Menu and the table listing defined packet filter function will be displayed, as shown in Figure 3.12a. In this page, you may **Add**, **Delete** or **Edit** a filtering function. You may also select to send or discard the packet if it matches the filtering rules.

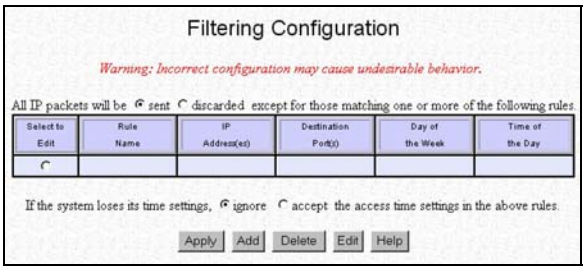

Filtering Configuration
Warning: Incorrect configuration may cause undesirable behavior.
All IP packets will be sent discarded except for those matching one or more of the following rules.
Select to Edit
Rule Name
IP Address(es)
Destination Port(s)
Day of the Week
Time of the Day
If the system loses its time settings, ignore accept the access time settings in the above rules.
Apply
Add
Delete
Edit
Help

Figure 3.12a Table Listing Defined Filter Functions

3. Press the **Add** button to define a new function for **Time-based Access Management**. The following page will be displayed as shown.

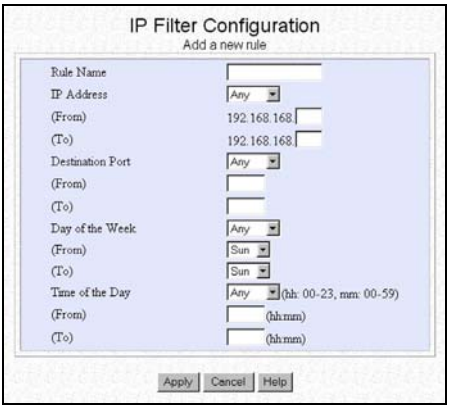


Figure 3.12b Defining Filtering Function

4. To define a rule for **Time-based Access Management**, you need to know the IP address of the computers where this rule applies. For example, if you wish to disallow two computers (IP address of 192.168.168.10 and 192.168.168.11) to access to the Internet between 10:00PM to 8:00AM, you may define a rule with the following parameters:

Rule Name	Enter your preferred name for this rule
IP Address	Select **Range** from the drop down menu
(From)	192.168.168.10
(To)	192.168.168.11
Destination Port	Any
(From)	<blank>
(To)	<blank>
Day of the Week	Any
(From)	Sun
(To)	Sun
Time of the day	Select **Range** from the drop down menu
(From)	22:00
(To)	08:00

5. Press the **Apply** button to add this filtering function into the list.

6. Ensure that the **Sent** radio button is "checked".

7. Press the **Apply** button for the changes to be effective.

3.12.2 Internet Application Filtering

To define a function to perform **Internet Application Filtering**:

1. Press the **Add** button at the filtering configuration page as shown in Figure 3.12a.

2. To define a rule to perform Internet Application Filtering, you need to know the TCP port of the application of which this rule applies. For example, if you wish to stop the computers from connecting to the Internet via a TELNET (uses TCP Port 23) session, you may define a rule with the following parameters:

Rule Name	Enter your preferred name for this rule
IP Address	Select **Any** from the drop down menu
(From)	<blank>
(To)	<blank>
Destination Port	Select **Single** from the drop down menu
(From)	23
(To)	<blank>
Day of the Week	Any
(From)	Sun
(To)	Sun
Time of the day	Select **Any** from the drop down menu
(From)	<blank>
(To)	<blank>

3. Press the **Apply** button to add this filtering function into the list.

4. Ensure that the **Sent** radio button is "checked".

5. Press the **Apply** button for the changes to be effective.

3.13 8e6 Internet Filtering

8e6 Technologies is the original developer of X-Stop filtering solutions which has been a pioneer in Internet Access Management technology. It develops customized Internet Access Management network applications for businesses, ISPs and the education market. Internet Filtering is important in this technological society as it helps to secure others from accessing to certain websites, such as accessing to undesirable content website in school or library, etc.

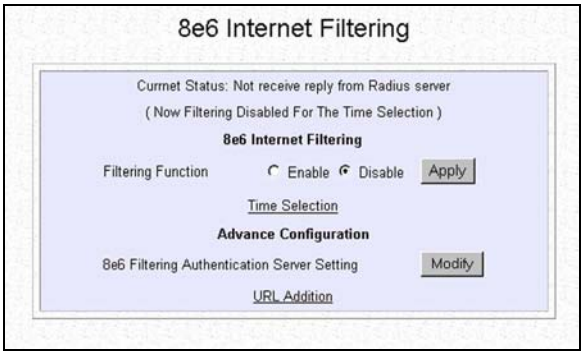


Figure 3.13a 8e6 Internet Filtering

Time Selection

Enabling the filtering function will prompt 8e6 to start checking the packets that are being sent or received. If you wish to select certain period of time to activate the filtering function, you can simply hit on the **Time Selection** option and the following GUI will appears. Click on the **Apply** button to confirm the configuration.

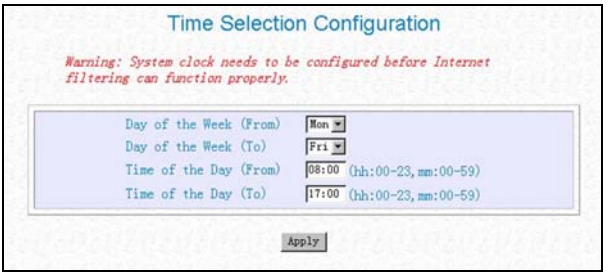


Figure 3.13b Time Selection Configuration

URL Addition

For some of the website which the system administrator do not wish to others to access, he can simply:

1. Open a new text document.
2. Type in the URL address and saved the document.
3. Click the **URL Addition** option as shown in Figure 3.13a.
4. The GUI in Figure 3.13c will appear. Click on the **Browse..** button and locate your saved text document.
5. Hit on the **Load** button to activate the filtering configuration.

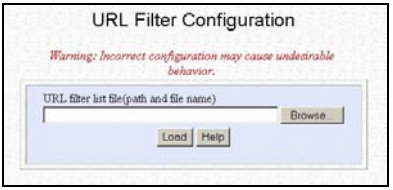


Figure 3.13c URL Filter Configuration

Advanced Configuration

You may leave this section as its default setting. The information for this section is provided by 8e6, therefore you do not need to do anything.

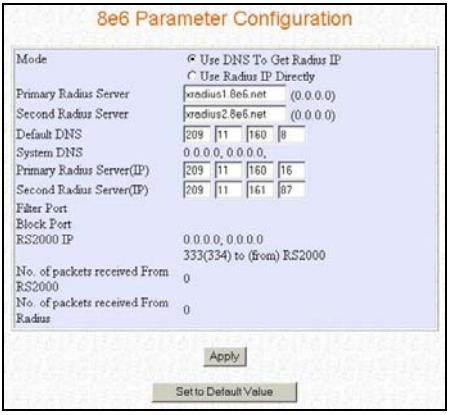


Figure 3.13d 8e6 Parameter Configuration

3.14 Compex NetPassage 16A's System Tools

The web-based configuration interface of Compex NetPassage 16A comes with a set of system tools for you to define the name for your Compex NetPassage 16A, setting the router's clock, upgrading the firmware, saving & restore router's profile and changing the administrative password.

3.14.1 Setting Router Identity

You may define a name for your Compex NetPassage 16A. This name will also be used as a DHCP Client ID when it negotiates for an IP release from your ISP.

1. Click on the **Router Identity** from the Command Menu and the router identity configuration page will be displayed as shown below.

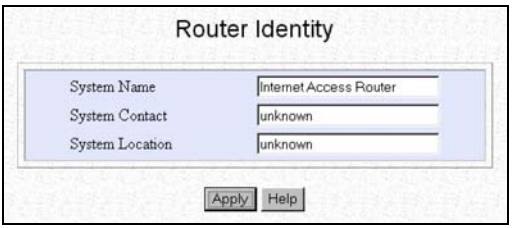


Figure 3.14a Configuring Router's Identity

2. Enter the Name, the Contact person and the Location of Compex NetPassage 16A.

3. Press the **Apply** button for the changes to be effective.

3.14.2 Synchronizing Router's Clock with your Computer

Compex NetPassage 16A is specially designed with a SNTP compatibility and router's clock that can be synchronized with the managing computer. The administrative function such as Time-based Access Management relies on the router's clock. Therefore, it is important that the router's clock is set correctly.

1. Click on the **Set Router's Clock** from the Command Menu and the System Time Setting window will be displayed as shown below.

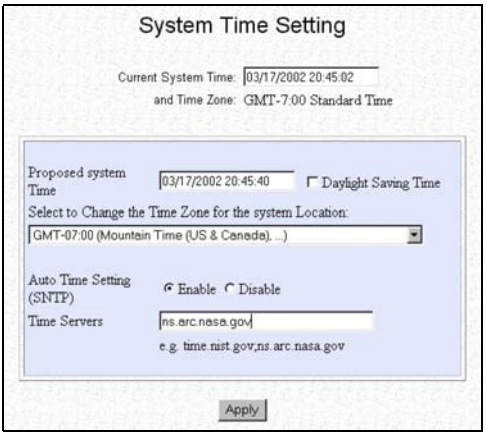


Figure 3.14b Synchronizing Router's Clock

2. The **Proposed Router Time** will display the system time of your managing computer.

3. Press the **Enable** radio button at **Auto Time Setting** and enter your preferred time server in the text box, as shown above.

4. Press the **Apply** button for the changes to be effective.

5. Save the configuration profile.

3.14.3 Upgrading Router's Firmware

Compex NetPassage 16A comes with the firmware upgrade capability. You may download the latest firmware from Compex corporate website (http://www.compex.com.sg or http://www.cpx.com) and update the firmware of your Compex NetPassage 16A.

1. Click on the **Firmware Upgrade** from the Command Menu and the firmware upgrade page will be displayed as shown below.

Figure 3.14c Upgrading Router's Firmware

2. Press the **Browse** button and locate the firmware image from your computer.

3. Press the **Upgrade** button to update your Compex NetPassage 16A's firmware. It is critical that the power supply is not cut off during the firmware upgrade process. Once the firmware upgrade process is completed, your Compex NetPassage 16A will restart.

CAUTION
Make sure that the power supply is not cut off during the firmware upgrade process. If Compex NetPassage 16A looses power supply during firmware upgrade process, the firmware will be corrupted and Compex NetPassage 16A will no longer be functional.

3.14.4 Profile Saving, Restore & Reset to Defaults

You may save the configuration profile of your Compex NetPassage 16A onto the hard disk of your managing computer and restore this profile in a later time. You may also reset the configuration of your Compex NetPassage 16A to factory defaults.

1. Click on the **Save or Reset Settings** from the Command Menu and the following page will be displayed as shown below.

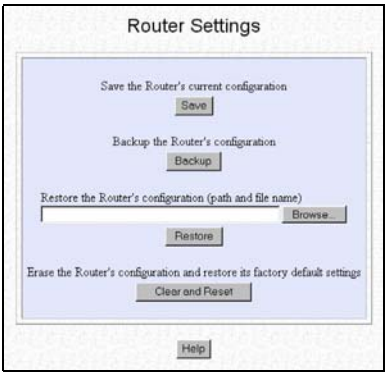


Figure 3.14d Saving, Restore and Reset Profile

2. Press the **Save** button if you wish to save the configuration profile into Compex NetPassage 16A's flash ROM. Press the **Backup** button if you want to save the configuration profile onto the hard disk. If you want to restore a profile, press the **Browse** button to select the file from the hard disk and press the **Restore** button. If you wish to reset your Compex NetPassage 16A back to factory defaults, press the **Clear and Reset** button.

CAUTION
Pressing the **Clear and Reset** button will discard all the configuration you have saved to Compex NetPassage 16A's flash ROM.

3.14.5 Rebooting Compex NetPassage 16A

You may reboot your Compex NetPassage 16A manually from the web-based management interface. Please always ensure that the changes have been saved before rebooting the router.

CAUTION
If you reboot Compex NetPassage 16A without saving the configuration, all the unsaved configuration will be lost after reboot.

1. Click on the **Reboot Router** from the Command Menu.
2. Press the **Yes** button to reboot the router.

3.14.6 Changing Administrative Password

By default, the administrative password is “password”. You may change the password to your preferred string.

1. Click on the **Change Password** from the Command Menu.
2. Type in the **Old Password**, the **New Password** and **Confirm Password**. Press the **Change Password** button to make the changes effective.

Chapter 4 Wireless LAN Option

Compex NetPassage 16A supports a wireless LAN option fully compliant with IEEE 802.11b. If you wish to activate the wireless LAN option, you may install a Compex *iWave*Port WL11A or WL11A+ into the PCMCIA slot of your Compex NetPassage 16A. Compex NetPassage 16A activated with wireless LAN option distributes broadband Internet access to the Fast Ethernet & Wireless segment, shares the resources between the Fast Ethernet network and the wireless LAN, or functions as a LAN-to-LAN Wireless Bridge.

In compliance with IEEE 802.11b, Compex NetPassage 16A wireless LAN option utilizes the 2.4GHz ISM (Industrial, Scientific & Medical) band for up to 11Mbps & 5.5Mbps data transmission, while backward compatible with the older 2Mbps and 1Mbps standard. To ensure security, Compex NetPassage 16A wireless LAN option uses private encryption key for communication over the wireless network. This technology is known as Wire Equivalent Privacy (WEP) encryption.

4.1 Activating Compex NetPassage 16A Wireless LAN Option

To activate Compex NetPassage 16A wireless LAN option, you may install a Compex *iWave*Port WL11A or WL11A+ wireless LAN card into the PCMCIA slot of Compex NetPassage 16A.

1. Turn off the power supply of Compex NetPassage 16A.

2. Gently insert Compex *iWave*Port WL11A or WL11A+ into the PCMCIA slot of Compex NetPassage 16A.

NOTE
If you are install Compex *iWave*Port WL11A on Compex NetPassage 16A, please ensure that the firmware version of the WL11A is 0.8.3 or above. If the firmware of the WL11A is earlier than 0.8.3, please obtain the latest firmware from Compex corporate website (http://www.compex.com.sg or http://www.cpx.com).

CAUTION
If the wireless LAN card is not detected, the WLAN setup option will not be displayed.

4.2 Operating Mode of Compex NetPassage 16A Wireless LAN Option

Compex NetPassage 16A wireless LAN option supports two operating modes, the **AP Mode** and the **Client Mode**. You may selectively choose the operating mode based on your application.

In **AP Mode**, Compex NetPassage 16A distributes the broadband Internet access to the Fast Ethernet & wireless network, and bridge the wireless LAN to the Fast Ethernet network. Please refer to Figure 4.2a.

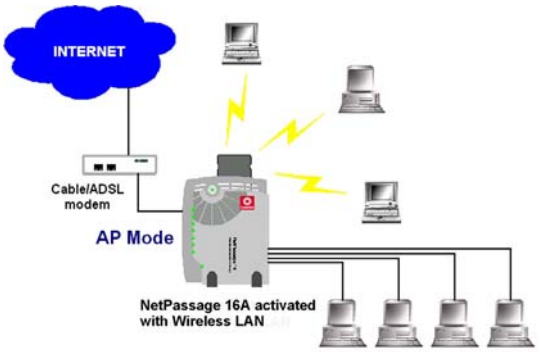


Figure 4.2a Compex NetPassage 16A Wireless LAN option functions in AP Mode

In **Client Mode**, Compex NetPassage 16A is capable of communicating to a Compex NetPassage 16A in AP mode, or any other wireless access point, functioning as a LAN-to-LAN wireless Bridge. Please refer to Figure 4.2b.

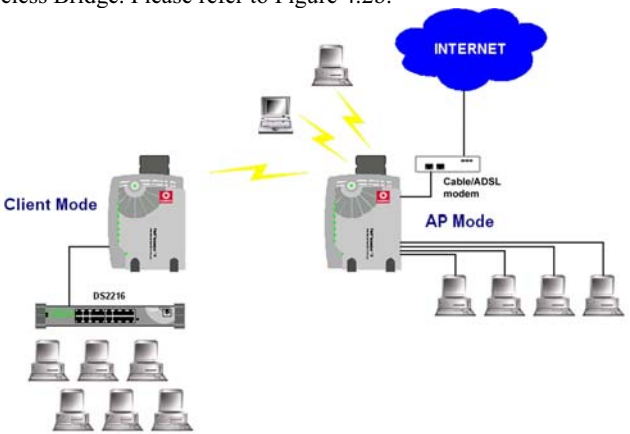


Figure 4.2b Compex NetPassage 16A Wireless LAN option in Client Mode

4.3 Wireless Pseudo VLAN

With more deployments of IEEE 802.11b Wireless LAN in the public premises such as the airport, university campus and fair ground, there has been a rising concern over the privacy level that the 11Mbps wireless LAN can offer. Can you imagine yourself surfing the Internet in the commercial hotspots and someone is peeking at your files? WEP (Wire Equivalent Privacy) provides only privacy against unauthorized access to the wireless network but assuming those who have already gained access to the network to be "trusted". While privacy remains an issue for most public Wireless LAN implementations, the release of Wireless Pseudo VLAN, combines with WEP, brings another level of privacy among users or groups of user.

The Wireless Pseudo VLAN defines a single Wireless LAN into multiple Virtual LANs. Communication is only possible between wireless nodes of the same VLAN. The Wireless Pseudo VLAN may be defined to contain a single user for each VLAN, or a group of users per VLAN, referred as *Per Node* and *Per Group* respectively.

4.3.1 Per Node Wireless Pseudo VLAN

Per Node Pseudo VLAN, if implemented, segregates every wireless node in its own Pseudo VLAN. Wireless clients may access to the Internet. However, communications among wireless nodes are blocked. This type of Pseudo VLAN is most suitable in public premises such as the airport. Users who surf the Internet via the wireless network in the airport can be certain that their files are not open for other users to view. WEP (Wire Equivalent Privacy) may be defined in conjunction with Per Node Pseudo VLAN, providing security against unauthorized access to the wireless network. Refer to Figure 4.3a.

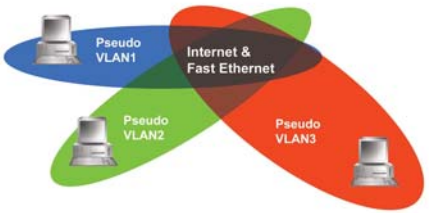


Figure 4.3a Per Node Pseudo VLAN segregates every wireless clients in their own VLAN

4.3.2 Per Group Wireless Pseudo VLAN

In contrasting with Per Node Pseudo VLAN that supports a single user for each VLAN with a common WEP key, Per Group Pseudo VLAN supports multiple wireless nodes per VLAN, with different WEP key for each Pseudo VLAN. Users from the same Pseudo VLAN may access to one another provided that the WEP key is correct. Users from two different Pseudo VLANs, however, cannot communicate with one another. Please refer to Figure 4.3b.

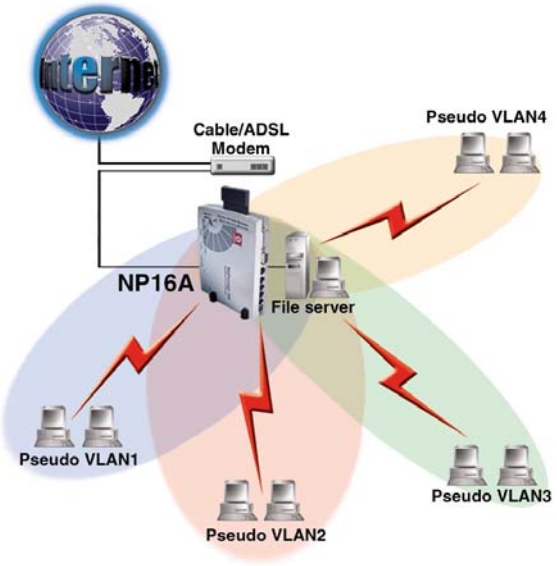


Figure 4.3b Per Group Pseudo VLAN defines 4 Pseudo VLANs, each with its own WEP key and contains a group of users

4.4 Configuring Compex NetPassage 16A's Wireless LAN Option

Before you start configuring Compex NetPassage 16A's wireless LAN, you must ensure that your Compex *iWave*Port WL11A or WL11A+ is inserted into the PCMCIA slot of Compex NetPassage 16A.

If Compex *iWave*Port WL11A or WL11A+ is not properly inserted into Compex NetPassage 16A, the following message will be displayed in the Message Window:

NOTICE: no wireless card detected

If you have installed a Compex *iWave*port WL11A on Compex NetPassage 16A but the firmware is not 0.8.3 or newer, the following message will be displayed in the Message Window:

NOTICE: wireless card firmware must have v0.8.3 or higher

You may download a copy of WL11A Firmware Update Utility 0.8.3 from Compex corporate website (http://www.compex.com.sg or http://www.cpx.com).

4.4.1 Configuring Compex NetPassage 16A in AP Mode

Before proceeding, you must first decide which operating mode that you want your Compex NetPassage 16A to operate in, **AP Mode** or **Client Mode**. If you intend to share the broadband Internet access with your wireless clients, you should configure your Compex NetPassage 16A to **AP Mode**.

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed as shown below.

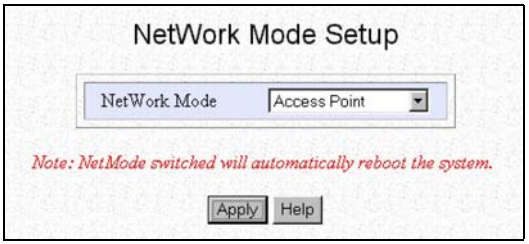


Figure 4.4a Setting Up Wireless Operating Mode

2. Select **Access Point** from the drop down menu and press the **Apply** button. The access point configuration page will then be displayed.

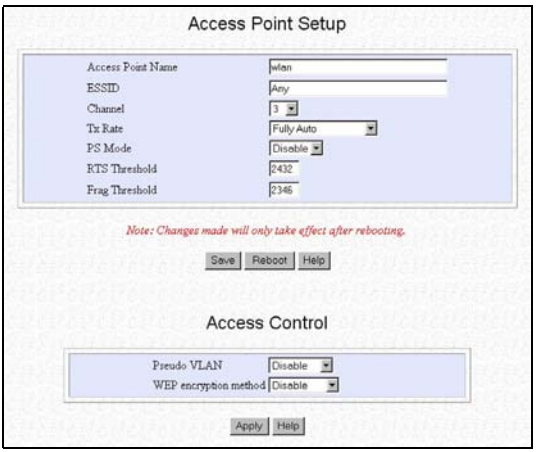


Figure 4.4b Configuring Compex NetPassage 16A In AP Mode

3. Enter the parameters into the respective fields:

Access Point Name Enter a preferred name for your Access Point.

ESSID Enter a name as the ESSID. Your wireless clients must be configured with the same ESSID in order to access this Compex NetPassage 16A. Do not modify the default name if you are not sure what to do.

Channel Select a frequency channel for wireless communication.

Tx Rate Select a transmission rate from the drop down menu.

PS Mode Disable/Enable the power saving mode.

RTS Threshold Compex NetPassage 16A uses CSMA/CA method to transmit short data packets but uses RTS/CTS mechanism to transmit long data packets. Packet size smaller than RTS Threshold is considered short packet whereas larger or equal to RTS Threshold is considered long packet. Do not modify the default value if you are not sure what to do.

Frag Threshold	This field is the Fragmentation Threshold. Packet larger than Fragmentation Threshold will be broken into pieces for transmission. Do not modify the default value if you are not sure what to do.

4. Press the **Save** button followed by the **Reboot** button. Once your Compex NetPassage 16A restarts, it is ready to distribute broadband Internet access to your wireless clients as well as sharing resources between the Fast Ethernet and Wireless network.

If you wish to implement Wireless Pseudo VLAN, go to **Section 4.4.3** titled **Implementing Wireless Pseudo VLAN**. If you wish to define private encryption for your wireless network, go to **Section 4.4.4** titled **Defining WEP Private Encryption**.

4.4.2 Configuring Compex NetPassage 16A in Client Mode

If you wish to connect two Fast Ethernet segments using two units of Compex NetPassage 16A activated with wireless LAN options, you need to configure one unit of them in **AP Mode** and other in **Client Mode**. Refer to **Section 4.2** titled **Operating Mode of Compex NetPassage 16A Wireless LAN Option** for the application of Client Mode.

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Select **Access Point Client** from the drop down menu and press the **Apply** button. The configuration interface will then prompt you to reboot the router, press the **Reboot** button to restart your Compex NetPassage 16A.

3. Re-log in to the configuration interface and click on the **WLAN Setup** from the Command Menu again. You will see that the operating mode is now set to **Access Point Client**.

4. Press the **Apply** button and the access point client configuration window will then be displayed, as shown in Figure 4.4c.

Figure 4.4c Configuring Compex NetPassage 16A In Client Mode

5. Enter the parameters into the respective fields:

Station Name	Enter a preferred name for your Access Point Client.
SSID	Enter the SSID of the wireless access point that you wish this access point client to access to.
Tx Rate	Select a transmission rate from the drop down menu.
PS Mode	Disable/Enable the power saving mode.
RTS Threshold	Compex NetPassage 16A uses CSMA/CA method to transmit short data packets but uses RTS/CTS mechanism to transmit long data packets. Packet size smaller than RTS Threshold is considered short packet whereas larger or equal to RTS Threshold is considered long packet. Do not modify the default value if you are not sure what to do.

Frag Threshold	This field is the Fragmentation Threshold. Packet larger than Fragmentation Threshold will be broken into pieces for transmission. Do not modify the default value if you are not sure what to do.

6. Press the **Save** button followed by the **Reboot** button to restart your Compex NetPassage 16A. Once restarts, this Compex NetPassage 16A will be operating in Client Mode.

If the Access Point that this Compex NetPassage 16A is accessing to has implemented WEP private encryption, go to **Section 4.4.4** titled **Defining WEP Private Encryption**.

4.4.3 Implementing Wireless Pseudo VLAN

Compex NetPassage 16A Wireless LAN Option supports two types of Wireless Pseudo VLAN, **Per Node** and **Per Group**. To understand Wireless Pseudo VLAN and its application, please go to **Section 4.3** titled **Wireless Pseudo VLAN**.

To implement Per Node Wireless Pseudo VLAN:

NOTE
Wireless Pseudo VLAN can only be implemented when Compex NetPassage 16A is operating in AP Mode.

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Press the **Apply** button and the access point configuration window will be displayed, as shown in Figure 4.4b.

3. Expand the **Pseudo VLAN** drop down menu and select **Per Node**.

4. Press the **Apply** button and Compex NetPassage 16A shall reboot.

Once Compex NetPassage 16A restarts, Per Node Wireless Pseudo VLAN is implemented. If you wish to implement WEP private encryption in conjunction with Per Node Wireless Pseudo VLAN, please go to **Section 4.4.4** titled **Defining WEP Private Encryption**.

To implement Per Group Wireless Pseudo VLAN:

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Press the **Apply** button and the access point configuration window will be displayed, as shown in Figure 4.4b.

3. Expand the **Pseudo VLAN** drop down menu and select **Per Group**.

4. Press the **Apply** button and the Per Group Pseudo VLAN membership definition window will be displayed, as shown in Figure 4.4d.

Figure 4.4d Defining Per Group VLAN Membership

5. Compex NetPassage 16A supports up to 4 Per Group Pseudo VLANs. "Check" the VLAN Group box which Pseudo VLAN you wish to implement. For example, if you wish to implement two Per Group Pseudo VLAN, you may "check" the boxes on Group1 and Group 2.

6. Press the **Add** button to begin adding members into the Per Group Pseudo VLAN, as shown in Figure 4.4e. The Per Group Pseudo VLAN membership is defined based on the MAC address.

Figure 4.4e Configuring Compex NetPassage 16A In Client Mode

7. Select the Per Group Pseudo VLAN that you wish to add a member to by selecting from the **GroupID** drop down menu. Enter the MAC address of the wireless client that you wish to add to this Per Group Pseudo VLAN, with the format as xx-xx-xx-xx-xx-xx. Press the **Apply** button to add this MAC address into the Per Group Pseudo VLAN.

8. Repeat Step 7 & 8 until all the wireless clients have been added to their respective Per Group Pseudo VLAN.

9. Press the **Apply** button followed by the **Reboot** button to complete the process.

After Compex NetPassage 16A restarts, the Per Group Wireless Pseudo VLANs have been implemented based on the membership you have defined. Per Group Wireless Pseudo VLAN supports different WEP private encryption key for different Pseudo VLAN. If you wish to define WEP private encryption, please go to **Section 4.4.4** titled **Defining WEP Private Encryption.**

4.4.4 Defining WEP Private Encryption

Compex NetPassage 16A Wireless LAN option supports two types of WEP private encryption, 64-bit WEP and 128-bit WEP.

WEP Private Encryption in AP Mode – Without Pseudo VLAN

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Press the **Apply** button and the access point configuration window will be displayed, as shown in Figure 4.4b.

3. Expand the **WEP encryption method** drop down menu and select the preferred private encryption, 64-bit or 128-bit. Press the **Apply** button and the WEP definition page will be displayed, as shown in Figure 4.4f.

Figure 4.4f Defining WEP Private Encryption

4. The 64-bit WEP and 128-bit WEP are defined as 40-bit and 104-bit binary number respectively, in hexadecimal format. Select the preferred Key ID (Key0 to Key3) "checking" the radio button, and enter the WEP private encryption key into the respective text box.

CAUTION
If you have chosen to use a specific Key ID, the wireless clients accessing to this Compex NetPassage 16A must be configured with the same Key ID in their WEP definitions.

5. Press the **Save** button and press the **Reboot** button to restart Compex NetPassage 16A.

WEP Private Encryption in AP Mode – With Per Node Pseudo VLAN

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Press the **Apply** button and the access point configuration window will be displayed, as shown in Figure 4.4g.

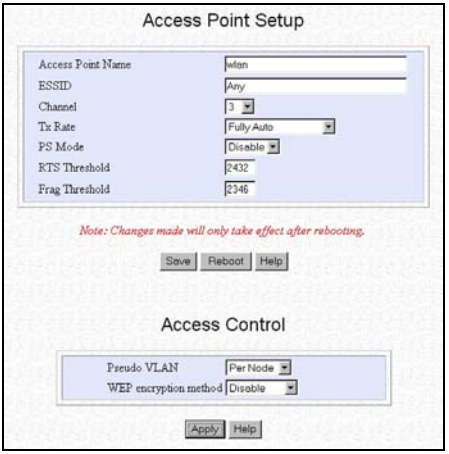


Figure 4.4g AP Mode Configuration Page

3. Expand the **WEP encryption method** drop down menu and select the preferred private encryption, 64-bit or 128-bit. Press the **Apply** button and the WEP definition page will be displayed, as shown in Figure 4.4f.

4. The 64-bit WEP and 128-bit WEP are defined as 40-bit and 104-bit binary number respectively, in hexadecimal format. Select the preferred Key ID (Key0 to Key3) "checking" the radio button, and enter the WEP private encryption key into the respective text box.

CAUTION
If you have chosen to use a specific Key ID, the wireless clients accessing to this Compex NetPassage 16A must be configured with the same Key ID in their WEP definitions.

5. Press the **Save** button and press the **Reboot** button to restart Compex NetPassage 16A.

WEP Private Encryption in AP Mode – With Per Group Pseudo VLAN

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Press the **Apply** button and the access point configuration window will be displayed, as shown in Figure 4.4h.

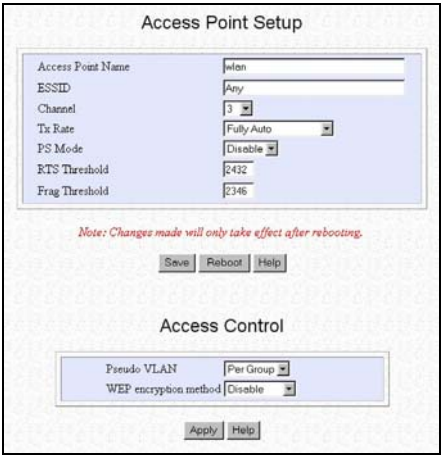


Figure 4.4h AP Mode Configuration Page

3. Expand the **WEP encryption method** drop down menu and select the preferred private encryption, 64-bit or 128-bit. Press the **Apply** button and the WEP definition page will be displayed, as shown in Figure 4.4i.

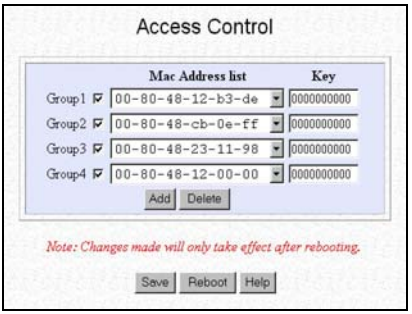


Figure 4.4i Defining WEP Private Encryption for Per Group Pseudo VLAN

4. The 64-bit WEP and 128-bit WEP are defined as 40-bit and 104-bit binary number respectively, in hexadecimal format. Each Per Group Pseudo VLAN supports its own WEP key. Enter the WEP private encryption keys into the respective text boxes.

5. Press the **Save** button followed by the **Reboot** button to complete the process.

WEP Private Encryption in Client Mode

1. Click on the **WLAN Setup** from the Command Menu and the Wireless LAN operating mode setup window will be displayed, as shown in Figure 4.4a.

2. Select **Access Point** from drop down menu.

3. Press the **Apply** button and the access point client configuration window will be displayed, as shown in Figure 4.4c.

4. Expand the **WEP encryption method** drop down menu and select the preferred private encryption, 64-bit or 128-bit. Press the **Apply** button and the WEP definition page will be displayed, as shown in Figure 4.4f.

5. The 64-bit WEP and 128-bit WEP are defined as 40-bit and 104-bit binary number respectively, in hexadecimal format. Select the preferred Key ID (Key0 to Key3) “checking” the radio button, and enter the WEP private encryption key into the respective text box.

Press the **Save** button followed by the **Reboot** button to complete the process.

Appendix A Console Commands

SHOW Command

SYNTAX	DESCRIPTION
SHOW IP	Display the IP information of the LAN and WAN interface
SHOW IP STAT	Display the statistics of the IP packets
SHOW ICMP STAT	Display the statistics of the ICMP packets
SHOW UDP STAT	Display the statistics of the UDP packets
SHOW TCP STAT	Display the statistics of the TCP packets
SHOW IP ROUTE TABLE	Display the routing table
SHOW IP STATIC NAT TABLE	List defined virtual servers based on IP forwarding
SHOW PORT STATIC NAT TABLE	List defined virtual servers based on port forwarding
SHOW SYSTEM	Display the system information
SHOW RIP	Display the status of the dynamic routing protocol
SHOW GATEWAY	Display the gateway IP address of the WAN interface
SHOW DHCP	Display the DHCP information
SHOW DHCP RESERVE	Display the DHCP reservations
SHOW DHCP LEASE	Display the leased IP information
SHOW ETHERNET ADDRESS	Display the MAC address of the LAN & WAN interface
SHOW TELNET SESSION	Display the source IP of the open TELNET console session
SHOW TIME	Display current router's time
SHOW NAT STAT	Display the status of the NAT

SYNTAX	DESCRIPTION
SHOW ARP TABLE	Display the ARP table in the router
SHOW FILTER	List defined IP packet filtering rules

SET Command

SYNTAX	DESCRIPTION
SET IP LAN <IP ADDR> <NETMASK>	Set the IP address of the LAN interface
SET IP WAN <IP ADDR> <NETMASK>	Set the IP address of the WAN interface
SET GATEWAY <IP ADDR>	Set the gateway IP address of the WAN interface
SET CONSOLE <BAUD RATE>	Set the baud rate used by RS232 serial console management
SET SYSTEM NAME <STRING>	Set the router's identity
SET SYSTEM CONTACT <STRING>	Specify the contact person for this router
SET SYSTEM LOCATION <STRING>	Specify the location of this router
SET PASSWORD	Changing the administrative password
SET TIMEZONE <GMT DIFF>	Set the timezone based on GMT time difference
SET TIME <HH:MM:SS>	Set the router's time
SET DATE <MM/DD/YYYY>	Set the router's date
SET DHCP SERVER	Configure the DHCP server
SET PROMPT "<STRING>"	Set the text appear at the command console
SET WAN TYPE	Select the WAN type
SET FILTER MODE	Set the option on IP packet filtering rules

PING Command

SYNTAX	DESCRIPTION
PING <IP ADDR>	Ping a host by its IP address

RESET Command

SYNTAX	DESCRIPTION
RESET SYSTEM	Reboot the router
RESET CONFIG	Reset the configuration back to factory defaults

ADD Command

SYNTAX	DESCRIPTION
ADD IP ROUTE <DES> <GATEWAY>	Add an entry to the routing table
ADD IP STATIC NAT <PRI IP> <PUB IP>	Add a virtual server based on IP forwarding
ADD PORT STATIC NAT <PRI IP> <TCP/UDP> <FROM PORT> <TO PORT> "<RULE NAME>"	Add a virtual server based on Port Forwarding
ADD DHCP RESERVE <PRIV IP> "<HOST NAME>" <MAC ADDR>	Add a DHCP reservation
ADD FILTER	Add a IP packet filtering rule

ENABLE Command

SYNTAX	DESCRIPTION
ENABLE RIP <VERSION>	Enable RIP version 1 or 2
ENABLE NAT	Enable Network Address Translator
ENABLE DHCP SERVER	Enable DHCP server

DISABLE Command

SYNTAX	DESCRIPTION
DISABLE RIP	Disable RIP
DISABLE NAT	Disable Network Address Translator
DISABLE DHCP SERVER	Disable DHCP server

SAVE Command

SYNTAX	DESCRIPTION
SAVE CONFIG	Save the changes in configuration to the router's flash ROM

DISCONNECT Command

SYNTAX	DESCRIPTION
DISCONNECT TELNET SESSION	Disconnect from the TELNET console management

EDIT Command

SYNTAX	DESCRIPTION
EDIT FILTER <INDEX>	Edit a defined IP packet filtering rule

Appendix B ISP-Specific Notes

B.1 Singapore SingNet Broadband

WAN Type: PPP over Ethernet (PPPoE)
Username Format: <username>@singnet.com

B.2 Singapore Pacific Internet Broadband

WAN Type: PPP over Ethernet (PPPoE)
Username Format: <username>@pacific.net.sg

B.3 Germany T-DSL & T-Online

WAN Type: PPP over Ethernet (PPPoE)
Username Format: <Connection ID><T-Online Number>#0001@t-online.de

NOTE
The <Connection ID> and <T-Online Number> are provided by German Telecom.

B.4 Australia Optus@Home

WAN Type: Dynamic IP
DHCP Client ID: Set as Router's Identity

Appendix C Frequently Asked Questions

C.0 In the process of firmware upgrade, an error message appears on the message window and stops the upgrading process or the upgrade process was not completed.

To rectify this error, please **RESET** the NP16A by depressing the **RESET** button for 5 seconds. Next, log onto the configuration page using uConfig software and reinitiate the upgrade process again.

C.1 I have forgotten the IP address that I have set on my NetPassage 16A, what should I do?

You may run the utility NPFIND.EXE located in the Product CD, it will report the IP address of the NetPassage 16A found in the network.

C.2 The "CONN" LED on my NetPassage 16A is flashing rapidly, and I cannot connect to the web-based configuration interface, why?

The rapid flashing of the "CONN" LED indicates that the router firmware has been corrupted. The firmware recovery utility may be found on the Product CD.

C.3 I have configured NetPassage 16A with my broadband Internet account. I am able to PING the ISP gateway IP address. However, I cannot surf the Internet.

If you have not configured the DHCP server to configure the DNS information of the computers in the network, you need to manually configure the DNS entry on every computer. Without the DNS server, your will not be able to resolve domain name (eg www.compex.com.sg) into IP address. Refer to **Section 2.5 on how to configure for DNS server on the computer**.

C.4 I am using Cable Internet and have tried to configure NetPassage 16A to work with it. I just couldn't get the ISP to release an IP to me. When I connected my computer directly to the Cable modem, I am able to surf the Internet.

Your ISP has probably logged the MAC address of your computer. You should clone the MAC address of your computer to NetPassage 16A. Refer to paragraph titled **Cloning MAC Address to NetPassage 16A** under **Section 3.2.1**

C.5 I have activated the Wireless LAN Option on NetPassage 16A. All my wireless clients are now able to surf the Internet. However, my wireless clients cannot share the resources with each other.

You have probably activated Wireless Pseudo VLAN on NetPassage 16A. Wireless Pseudo VLAN strengthens the privacy by isolating the wireless clients in their respective Pseudo VLAN. If you wish to share resources among your wireless clients, deactivate the Wireless Pseudo VLAN.

C.6 I have installed a Compex iWavePort WL11A into my NetPassage 16A. However, I couldn't seem to get my wireless LAN working. I saw a message "NOTICE: wireless card firmware must have v0.8.3 or higher" in the message window.

The iWavePort WL11A that you have installed into NetPassage 16A does not have the required firmware revision. You should update the WL11A firmware to 0.8.3 or higher. You may obtain a copy of WL11A Firmware Update 0.8.3 from Compex corporate website (http://www.compex.com.sg or http://www.cpx.com).

C.7 What should I do if the firmware is corrupted?

Code can be corrupted due to power surging while uploading newer firmware resulting in router fail to startup.

This procedure shows how to reload the firmware to router should something go wrong and router could not startup properly.
Should this happened, the router would automatically switch to loader mode.
when the firmware is corrupted and need to be reloaded, the router DIAG LED will be OFF while the CONN LEDs will BLINK QUICKLY.

Pls refer to Table 1, item (a)

Table 1

Router Operation state	DIAG	CONN
(a) Firmware corrupted, need reload	OFF	Blinking quickly.(10/sec)
(b) Firmware upload successfully	OFF	Blinking slowly
(c) Firmware upload failed, need reload	OFF	Blinking quickly.(10/sec)
(d) Loader mode, ready for tftp	ON	(Steady not flashing)
(e) Writing uploaded firmware to flashrom	OFF	ON (Steady not flashing)
(f) Writing to flashrom successful	OFF	Blink slowly

How to recover router from failed firmware
==========
Power ON the router, check the DIAG and CONN LEDs status as described in table (1). If the LEDs do not blink as indicated in the table, you are experiencing other problems. Please call technical support for help.

1) Power OFF and disconnect router from the network.

2) Connect one end of a MDI cable to the LAN port on the router then connect the other end to your computer's LAN adapter.

3) Configure your computer's IP to: 192.168.168.100 with netmask 255.255.255.0. By default PC will also learn the IP 192.168.168.100 from router.

4) Insert NP16A CD containing the recovery file in CD-ROM and run the batch file, np16arcv.bat.

5) Hold the reset button and at the same time, power on the router, and it will automatically download the firmware to the router.

6) When completed, the DIAG LED will be OFF and the CONN LED will blink slowly.

7) Reset the router and it will startup normally.

8) If you still have problems, please call technical support for further help.

NOTE
The firmware image file, which you upload from the CD-ROM may not be the latest version. To get the most updated version, please go to www.cpx.com or www.compex.com.sg to download the firmware. Do not power down the device as data is transferring.

Please note that your firmware image file might be different. Please enter the name of that image file.

Please ensure that there is constant power supply to Compex NP16A while performing the recovery process.